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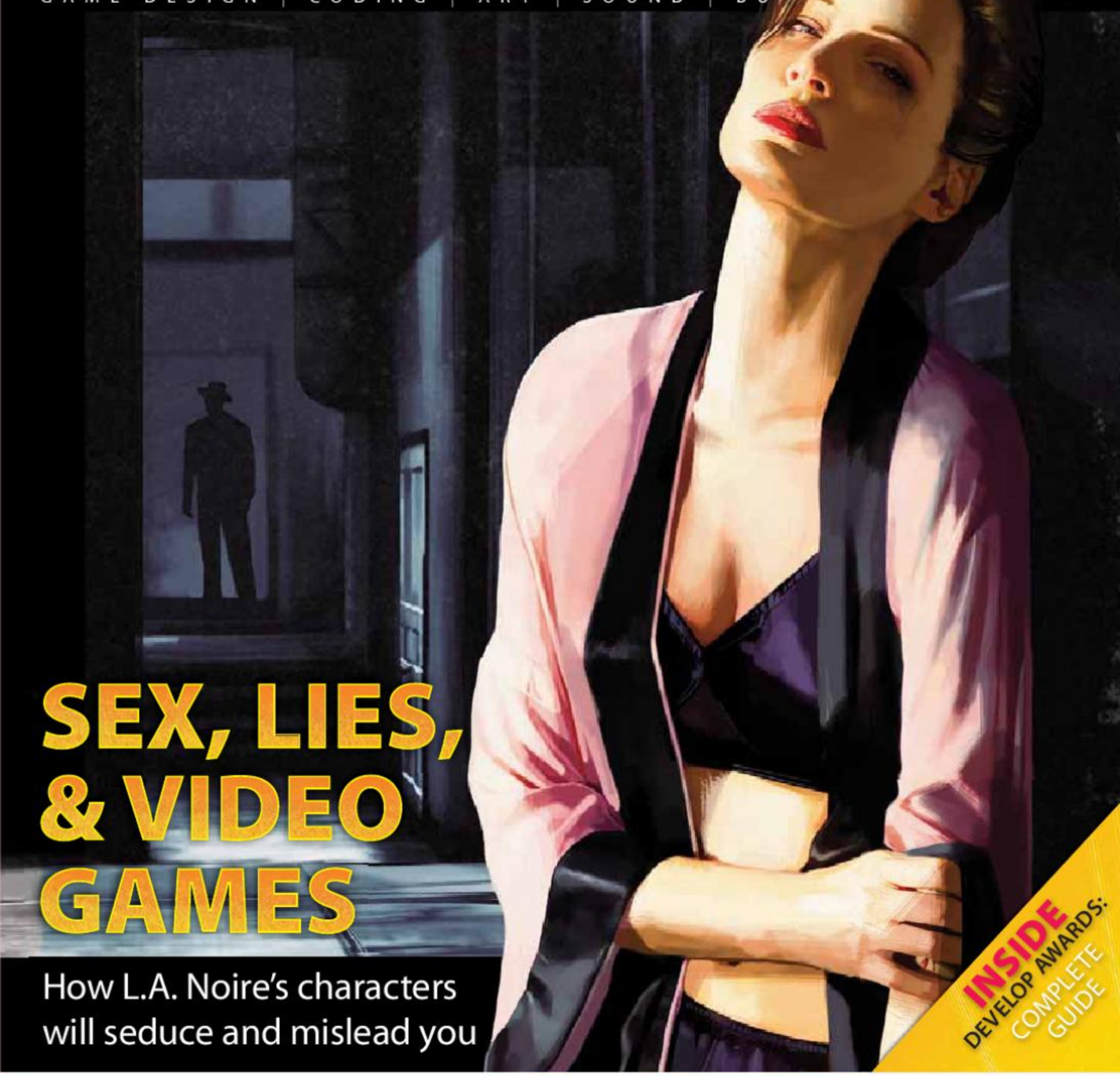

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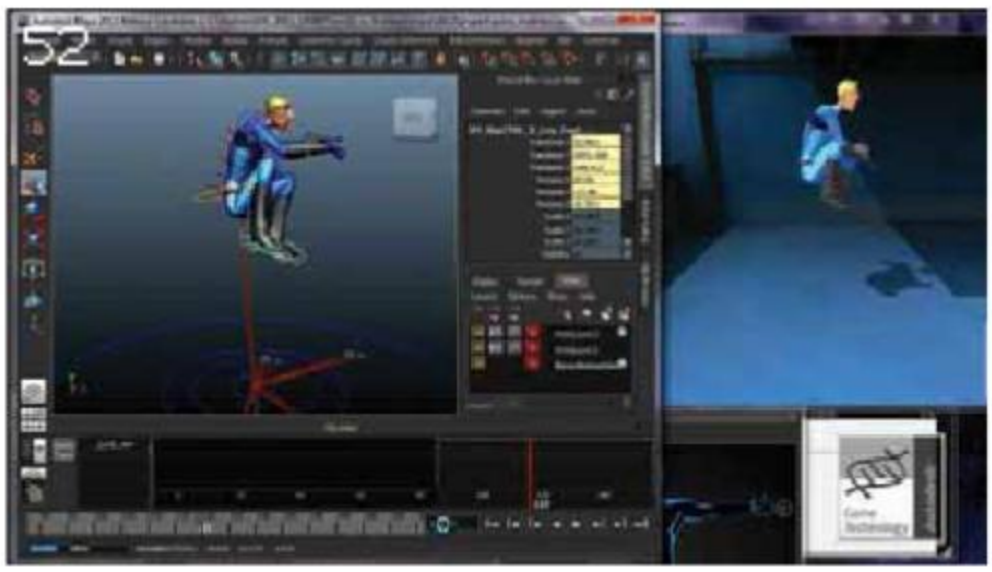

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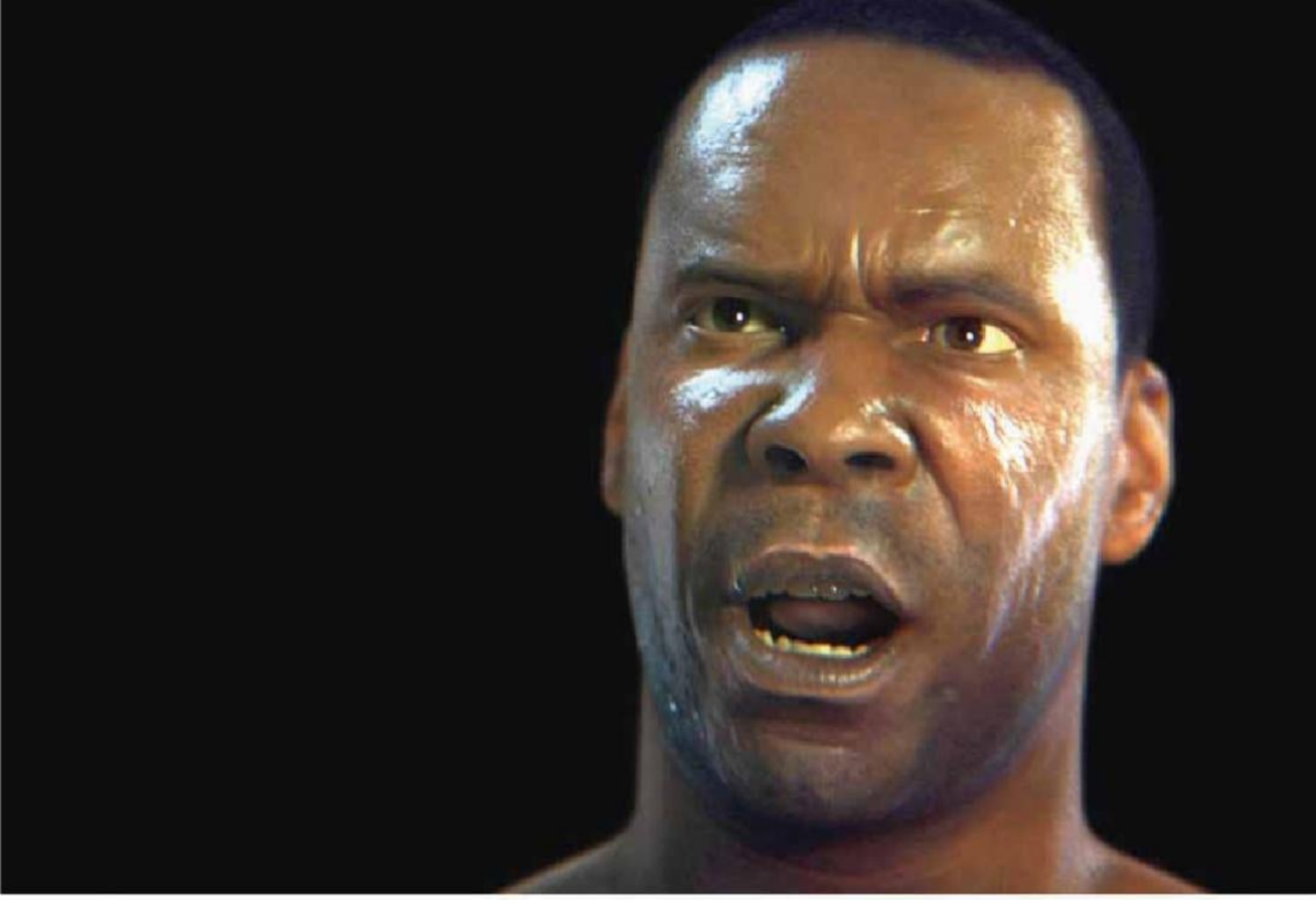

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ALPHA
ADVENTURES IN GAMES DEVELOPMENT: NEWS, VIEWS & MORE

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Facebook makes UK friends

Beefed up developer relations strategy kicks in to grow audience of studios making social games in Europe

by Michael French

Games like CityVille can attract over 60m Facebook games a day

SOCIAL giant Facebook is showing UK studios love with improved developer relations.

The firm has recently stepped up its activity throughout Europe in a bid to grow the network of firms making money from games on the hugely popular global social networking site. And it wants to prove it's not all American studios that are making the most of it.

In recent months Facebook has grown its London–based European HQ as a technical support and partnerships operation, also hosting a number of hack–day and 'coffee chats' for established and burgeoning developers.

Last month the firm hosted the latest of its monthly Facebook UK Developer Garages and a special Start–Up Day in London.

Key engineering staff told *Develop* that the more global outlook can help dispel the view that Facebook serves North America first, given its HQ is in Palo Alto.

The firm will "be in their timezone and understand the market" said Simon Cross, a former BBC exec who worked on the iPlayer and took the role of partner engineering at Facebook's UK office in London last September.

"Historically when we announce an update it's been seen as a big American company rolling out a new product [which other territories get later]," he said.

It's not lost on the company that some well–known game firms have "built billion dollar businesses on our platforms" and is now working hard to prove that developers of all sizes can cash in on Facebook's critical mass. With many of the smaller studios in the UK and Europe no doubt a target.

At the last count, the site had over 500m registered users – with 200m said by CEO Mark Zuckerberg to be casual games players.

CityVille and *FarmVille* creator Zynga can attract somewhere around 60m users a day to its games.

"We are not any longer just this funky platform for developers – at the very same time we care about ongoing support and stability," explained Cross.

> ***"We are no longer just a funky developer platform. We care about support and stability."***
> Simon Cross, Facebook

The social network site has started actively supporting companies of all sizes via a mix of networking, improved local support for developers making Facebook apps and using its API, and events.

For indies and start–ups, the firm has been running 'clinic' style coffee and networking mornings, plus the afformentioned monthly 'Developer Garage' in London.

Unlike the other Facebook Developer Garages – which the firm admitted it has to encourage developers to attend – the London one has become a regular and self–sustaining occasion.

The firm has also been touring Europe, attending larger events and working with bigger companies to integrate their strategies with the social world.

"By focusing on European developers and European companies we will have great examples of social media, social gaming and social content all made in this territory," said Cross.

"Now we have a presence and visibility in Europe."

Jason Sobel, Facebook's engineering manager – visiting the UK from the team in Silicon Valley to meet UK developers – added: "We really do want to be as global as we possibly can."

www.facebook.com

Editorial

Face facts

I've spent a lot of time in these columns recounting the changing age of opportunity for developers.

As older institutions crumble or shrink, hundreds of developers are being cut loose, turning towards download games, or voluntarily buggering off to make Facebook and iOS games.

But there is still a big momentum towards big budget games. And right now the hot topic there – as in some was it always was – is in how the content developed for these titles convinces the audience. It's become paramount to create realistic, engaging, believable characters. This month's cover star *L.A. Noire* embodies that. Being able to discern if an NPC is lying is a gameplay mechanic, reliant on a unique new type of facial animation. Faces that you believe, or will allow to convince you.

It's just one example in the way games development is blossoming around not just solving basic issues for things like physics and lighting, but how those solutions add up to a greater whole.

The challenge is making sure that there are enough bodies in the studios making these games. These big games need real people, fittingly, to work in coding and art farms and beget more convincing virtual people.

Assuming they haven't all buggered off to make Facebook and iOS games, that is.

***

Meanwhile, news that Facebook is more actively courting UK developers should come as good news to those not in the hi-res game.

What this also signifies is the swift maturation of the social network as a platform – a games platform in fact.

As liberating and open as Facebook's approach is, it's now entering the same race that Xbox, Sony and to a lesser extent Nintendo, have run so well. That of engaging and supporting local developers.

Facebook is here to stay as a game platform, and the company is now working hard to improve and reinforce just that.

But that also means, with Facebook as a 'platform-holder', it will have some way to go to catch up with said hardware manufacturers.

Michael French
michael.french@intentmedia.co.uk

CCP the latest to

Icelandic MMO developer shows 'space opera' running on tablet and

by Will Freeman

ICELANDIC MMO developer CCP could expand its empire to include tablet and smartphone games.

Speaking to *Develop* at its Fanfest event in Reykjavík, the firm said *Eve Online* would benefit greatly from an expansion to mobile.

On stage with representatives from Nvidia, CCP demonstrated a few seconds of both interactive spacecraft from *Eve* and the game's UI on a Tegra-2 powered tablet device, to delighted consumers.

The ambitious MMO was also shown for just a few seconds, running on an unconfirmed smartphone device.

"We have been working a lot on the backend to enable *Eve* over http. The problem that we run into there is that a lot of people seem to equate that with a web browser," explained CCP's CTO Halldór Fannar at a press conference immediately following the demonstration.

"It doesn't necessarily mean browser," he added. "What it means is any of these devices can start extracting data and also writing data back. It opens up the possibility of having dedicated applications for doing market transactions, managing your skill queue and fitting your spaceship."

Describing the creation of *Eve* for mobile platforms as part of an 'exploratory project' undertaken in collaboration with Nvidia to look at the quality of graphics possible on such devices, Fannar would not offer a release date. He did, however, remark that following the reveal *Eve's* infamously dedicated fanbase would likely demand to see a final product.

CCP has always involved its customers in designing and refining new features, and will likely play close attention to its customer's interest in any potential mobile versions.

> ***"It opens up the possibility of having dedicated applications for doing market transactions, managing your skill queue, and fitting your spaceship."***
>
> Halldór Fannar, CCP

Explaining Nvidia's relationship with CCP as mutually beneficial in driving the companies' progress Tony Tamasi, SVP of content and technology at the hardware giant, took to the stage during the presntations and made bold predictions about the potential of mobiles as a platform for high end MMOs.

"We're really at the launching point for mobile technologies," he said, later adding: "[Tegra 2 is] our first real stab at a mobile graphics processor. In the space of four-to-five years we going to see about 100 times increase in mobile capability. To give that a bit of context, in a couple of years on a mobile device – and by that I mean a tablet or

see smartphone opportunity

smartphone, and details new focus on accessibility for hardcore online game

Eve Online's famously intricate spaceships may soon be docking on mobile. Right: Halldór Fannar (Top) and Tony Tamasi

phone – you're going to see something potentially more versatile than your desktop PC today."

However, during the press conference, Fannar was quick to point out that presently CCP is not looking at running a full version of *Eve* on mobile.

"[To do] trading on the market or managing your skill queue, you don't need much in the way of graphics – but we are a very visually oriented company and our players are really attached to our models. It would be far more meaningful for them to see their assets."

PURE AND SIMPLE

CCP also used the 2011 Fanfest event to touch on a number of new directions planned for *Eve*, showing a new trailer that alluded to detailed interaction between the MMO and the CCP's upcoming console FPS *Dust 514*. The developer also discussed making *Eve's* notoriously intricate gameplay less tough for new players.

"*Eve* came out in 2003, and back then things like Facebook and iPhones didn't exist. People were much more tolerant of complexity. MMORPG players would seek games out and invest a lot of time in learning them," said CCP's creative director Torfi Frans (*above*) in an interview.

"The world has changed and we recognise that. As we talked about at the Fanfest keynote, we are investing a considerable amount of time in iteration and refactoring all systems, as you need to do when developing and established game like this, and the tenant of simplicity and accessibility is now very strong."

Frans confirmed that CCP is now going over numerous existing systems with a view to make them more accessible.

"I do not think that the problem is that *Eve* is too complex, but I think we did try and push too much complexity in the beginning. It was like thrusting a university education down the throat of a six-year-old."

www.eveonline.com

Independents' Day

This year the Develop in Brighton conference introduces Indie Dev Day. **Will Freeman** caught up with event advisory board member and Hello Games MD Sean Murray to find out more...

Sean Murray (above) believes both triple-A studios and indies have something to gain from meeting with one another at Develop in Brighton (main).

How important is indie development to the UK game development sector today?
I think the indie mentality is core to the games industry, or at least I hope it is. We're those fresh-faced fools who don't know what's impossible yet. Without that independent bloody-mindedness, we wouldn't have games like *Populous*, *Elite* or even *LittleBigPlanet*. The UK has always fostered a thriving independent development scene, more so now than ever.

I guess with so many larger, more traditional studios closing recently, we're seeing this growing gap between triple-A console blockbuster machines and the smaller, nimbler studios. It's these tiny outfits that are really leading the way and creating new forms of game on iPhone, Steam, XBLA, PSN and Facebook.

Considering that the indie community is supported by a number of grass roots 'lo-fi' events, why is an indie-focused event relevant at a more high profile conference like Develop in Brighton?
I like to think that this is Develop in Brighton's recognition of a growing trend in the UK. If we can get those triple-A developers to meet their bedroom coding counterparts, then that's a unique opportunity for everyone. Frankly I think there's a lot we can teach the more established industry, and vice versa.

There's a huge networking opportunity here for new start-ups too, which is what Develop has always been about.

You can be pretty sure that at Develop you can meet 'that man who can get you that NGP dev-kit', or 'the helpful PR lady with all the contacts'.

This is an opportunity to create the largest indie get together in the UK, which is genuinely exciting.

What can the indies and start-ups who attend the Indie Dev Day take away from the one-day conference?
We've chatted about this being sort of 'tales from the frontlines of development'. Hopefully what any indie wants: honest stories of blinding success and crushing failures. Hopefully people can learn from that. It's certainly something I'm looking forward to, and want to hear about.

> ***"We're seeing this growing gap between triple-A console machines and the smaller, nimbler studios. These tiny outfits are leading the way."***
>
> Sean Murray, Hello Games

I'm often struck by how white-washed and PR driven a lot of the more traditional game developer conference talks seem to have become. When you put an independent developer on stage, they are free to answer whatever questions you want to ask.

They'll tell you how many units they sold, how much for and where they were when they had the idea for their game; normally sat on the toilet.

How have you made sure the content is relevant to indies and start-ups?
I often go to conferences and sometimes find them a little irrelevant, or maybe light on actual content that I can go home and apply. For a start-up real-world, grounded knowledge is everything, and by getting together speakers from that hairy limit of development I think we can provide genuinely essential information.

We're looking at indie developers speaking to their counterparts about lessons learned, giving how-tos and spreading new ideas.

There's also a networking element. Why do established studios and industry veterans need to meet and pay attention to independents today?
I don't think any of us really have the opportunity to meet each other enough, listen enough or talk enough. I doubt either group would think they don't have a lot to learn from the other.

When I worked at EA I would love to have heard small teams discuss how they stay nimble, innovative or just survive.

That's even more interesting now, when a quick look down the iPhone charts shows just how many small teams are making a big impact with tiny budgets.

I think everyone joins the games industry to make their own games, and it'll be nice to hear from people who actually do that.

What does the Indie Dev Showcase bring to the conference?
The showcase is a place for indie developers to show just how vibrant, diverse and interesting independent development in the UK is. I'm looking forward to something similar to my first experience of visiting the IGF stand at GDC – each pod playing games with mind-blowingly different art styles, innovative gameplay and wildly disparate genres. That shows the strength and the passion of small teams, and it's something we want to showcase.
www.developconference.com

ANATOMY OF A BLOCKBUSTER

Our monthly dissection of a recent hit game...

Angry Birds

PUBLISHER: Chillingo

DEVELOPER: Rovio Mobile

FORMAT: iOS, Maemo, webOS, Android, Symbian, PSN, Windows, Mac OS X

PRICE: 59p

www.rovio.com

THE SENSATION

It's almost difficult to remember a time before the Prime Minister jokingly referred to his obsession with it, but the mega-fame avalanche of Rovio's *Angry Birds* began life as a little rolling snowball. Released at the close of 2009 with a relatively tiny 63 levels, the game grew in size, renown and distribution over 2010. Its availability flowered from iOS to include platforms like Android, Symbian and PSN before the year's end. By the one-year anniversary of its release, *Angry Birds* had been downloaded in its free and paid versions on its many different available platforms over 50 million times.

The exploits of the eponymous furious fowl have been used to parody the Israel/Palestine conflict, world leaders play the game on the toilet and seasonal updates have been released for Christmas, Halloween, Valentine's Day and St. Patrick's Day. There's no stopping the avalanche now.

THE GAME

Green pigs have stolen and eaten the eggs from a nearby flock of apparently flightless birds. The birds want revenge. They seek it by catapulting themselves at the shakily built houses the pigs hide in, hoping to crush them beneath their own creations. The birds also explode, just to make sure.

Plot is thin on the ground then, but plot has never really been the point in casual and mobile gaming. The fun is in the process, in sending manic, suicidal birds careering through the sky and down onto the fragile fortifications of the pigs. The repetition of missions, with the only varying factor being the strength of pig defenses and the number of birds and pigs on the ground, is what has lead the game to be so universally described as addictive. People want to take out every pig on every level, and get every available reward star in the process. *Angry Birds* is a true completionist's dream.

THE STUDIO

Back in 2003, Niklas Hed, Jamo Väkeväinen and Kim Dikert took part in a mobile games development competition at the Assembly demo party; a mass annual game development event in Finland. At the time all three were still students at the Helsinki University of Technology, but on winning the competition with a title called King of the *Cabbage World*, the group set up a company called Relude. That game was sold to Digital Chocolate and became the first real-time multiplayer mobile game in the world.

A round of business angel investment in 2005 coincided with the company changing its name to Rovio. It was four years later however, with the release of *Angry Birds*, that the company achieved international fame. In March of this year Rovio raised $42m in funds from venture capitalists, and now seems poised for world domination.

UNIQUE SELLING POINT

There are several reasons people pick *Angry Birds* over the near-endless equivalents available. Firstly, familiarity. The *Angry Birds* craze begets the *Angry Birds* craze, and word-of-mouth is still the most powerful sales tool in the world.

Of course, a game doesn't open to such acclaim. *Angry Birds* is unique in that it is truly accessible to everyone while tapping in to a universal level of entertainment that everyone can appreciate. The process of continually disassembling teetering, pig-populated structures by way of projectile avains is dumb fun of the finest quality. *Angry Birds* is unique because it does exactly what it sets out to do where so many other titles have failed.

WHY IT WORKS

The pigs ate the birds' children. Motivations don't really get more motivating. You'll want to make those pigs pay, or you'll want to take down the next castle of wood and glass, or you'll want to do both. The success of *Angry Birds* lies in its reduction to the very essence of what makes gaming engaging as a pastime. You have one destructive challenge to complete within a massive number of variations. The simple, rewarding thrill of watching structures shatter under the pressure of your exploding feathered ordinance works as catharsis on several levels, and presents enough of a challenge that everyone can feel like they have achieved something while nobody is excluded from being able to play.

TRY IT YOURSELF

The trick here is not to assume that because *Angry Birds* is a simple game, it'd be an easy one to replicate. Any fool can tell you that iOS is swamped with terrible titles that are cut from a similar cloth to Rovio's casual giant. Don't think you'll get away with releasing '*Tetchy Fowl*' anytime soon.

The draw of gaming lies in personal achievements. Take knocking things down, to steal a little from *Angry Birds* and make the link more obvious. What if you made a game where players take the role of God trying to stop humanity from completing the Tower of Babel? Leaving aside the potential for getting in religious hot water, it could work as a sort of *God Finger*-mixed-with-backwards-*Missile-Command*-like title. Every level could see humans building towers of greater strength, and God being granted special moves like 'Make Everyone Speak A Different Language'. It wouldn't be everyone's cup of tea, but it could work. Probably.

//COMMENT: BUSINESS

Analysing the analysts

by **Rick Gibson**, Games Investor Consulting

Can an analyst ever look closley enough at the industry to provide useful results?

AS THE retail market continues to slide and new gaming categories burst onto the scene, it's getting increasingly difficult to find out how big or fast growing the overall market or its components are.

At the same time, finding this out is becoming more important for companies wrestling with which horse to back or how to convince VCs and other external investors to fund their growth in these newer markets.

This month, I want to turn our spotlight on research providers and explain what to look for, what to avoid, and why market estimates can vary so widely between analysts.

A WORLD OF DIFFERENCE

The best example of massive differences in market projections can be found in mobile gaming. Whilst 2010 estimates for mobile gaming varied between researchers by 100 per cent (from around $3bn worldwide to over $6bn), 2013 forecasts were even more divergent, ranging from $4bn to as high as $12bn. There are several reasons why analysts can come up with such different interpretations of the same market.

The first – and most cynical – reason is that some can err on the side of bullishness over caution when it comes to market sizing because, put bluntly, this sells more reports. We frequently hear senior execs say they have selected a particular report over another simply because it has the most attractive market size figures for them to use in their investor documents.

In practice, market size overestimates benefit nobody except the research company; no investor will invest in a company based on market growth forecasts alone and the better ones will quickly learn what the more realistic figures are during their due diligence process.

The other reason is that it is extremely difficult to estimate the sizes of these new games markets or agree upon common metrics – such as a unit sale – for very different markets. Unlike retail, where publishers agree to share comparable sales data, most new markets have no such solid data sources, despite the fact that, as digitally distributed media, such tracking should be relatively straight forward.

> ***"The problem is that online publishers, developers and their distribution and payment partners are reluctant to share sales data."***

The problem is that online publishers, developers and their distribution and payment partners are reluctant to share actual sales data. Furthermore both their greater control of the network games supply chain and the lack of peer pressure have given them the power to say no. Whilst some markets in which traditional publishers operate, such as premium downloads, may eventually get sales charts and data, this is only a small fraction of the total online market. With around a dozen distinct network games markets (mobile, MMOGs, social and so on), there is zero prospect of the industry being able to produce a single reliable digital and retail chart. Faced with that dead end, what about separate studies of these market categories?

There are several methods analysts use for sizing markets, none of which are perfect, but all of which rely heavily on researchers using deep knowledge of the market category they are analysing.

One way is ground-up, estimating individual companies' – or games' – sales based on public or confidential acquired data. Another is top-down, using a solid piece of data – for example the number of PS3 owners – and work back from that to a market value (for example PSN sales), using other data sources for guidance.

TRIAL AND ERROR

In both cases, the margin for error is entirely based on the quality of the guiding data and the experience of the researchers. We believe that a mix of both yields the most reliable market figures, but it does not stop analysts with only a superficial understanding of gaming producing hopelessly inaccurate market perspectives.

The most suspect and, sadly, common way to size markets is using questionnaire-based consumer surveys. In isolation, this process is almost guaranteed to produce incorrect results because it relies on finding a representative cross-section of consumers (it's very easy for this to skew or self-select in a particular direction) who answer questions about their exact spending accurately – which few do. Then the results must be grossed up in the correct ratio to reflect the market as a whole.

Unfortunately the lack of concrete data has driven some companies to use this type of consumer research to size network games markets without any bottom-up research to act as common sense guidance.

When questioned, one such MMOG study's authors tried to justify hugely overestimated figures by pointing to several companies without realising that these companies' actual figures were public knowledge and represented a fraction of their estimates.

Needless to say, there are good analysts out there but you will need to exercise scrutiny and scepticism to identify them. You should ask: what is their motivation?

Do they have sufficient experience of the games markets they are talking about? Is their research methodology sound and can it be justified? Do their market size figures stack up next to public company data? Does it pass a common sense test? In other words, make sure you do your research before buying into (or from) them.

Rick Gibson is a director at Games Investor Consulting, providing research, strategy consulting and corporate finance services to the games, media and finance industries.
www.gamesinvestor.com

//COMMENT: OPINION

Death of the $50M game?

by **David Braben**, Frontier Developments

WE'VE JUST had the excellent film BAFTA and Oscars awards, with a healthy spread of high budget epic films and low budget hits.

Over the last few years film production budgets have ranged from $100k to $300m (*Avatar*), and on average they make good money for those creating them. Games revenues are comparable, and a list of the top grossing entertainment events include a comparable number of games and films.

At the same time we hear rumours about the death of the $50m game. EA made a loss for yet another quarter (is that ten in a row now?), and is blaming big console game budgets for this failure. We also hear that Activision might be in a similar position if it weren't for Blizzard, and its perhaps wounded cash cow, the *Call of Duty* series. Along with this there is the closure of numerous in-house studios (particularly in the UK).

So why is there such a difference in their financial success?

Why are big-budget games suffering, when titles like Call of Duty: Black Ops (above) easily court revenues comparible to Hollywood's blockbusters?

A CLEAR DIFFERENCE

Some differences are clear; most films spend a long time in the script/pre-production stage, and many are canned at this inexpensive stage. Few are canned after filming starts. Even less successful films have a long revenue tail beyond the theatrical release. After a month or so, DVD and rental/online revenue starts (and they don't suffer pre-owned as they police their 'not for rental or resale' requirement – with a separate 'for rental' version). Then later they earn again from the TV revenue. This tail can last decades for the more successful film – with a new round of sales as a new medium, like Blu-ray, comes along.

Film publishers get a roughly equivalent share of the box office takings on average (40-to-45 per cent after deducting box office share and residuals) as the publisher does of a new shrink-wrapped game.

Added to that, many films have already come close to break-even before their first box office receipt, because of product placement income. In addition, films are usually funded and bonded externally – and in most territories this is done tax-efficiently so the risk becomes attractive – leaving little risk to the publisher.

With a typical $50m shrink-wrapped 'core gamer' title, perhaps $20m is spent on development, $15m on marketing and $15m on cost of goods, and this doesn't include the large overhead of many publishers. All this before a single penny is earned back. Within two or three weeks of release pre-owned re-sales will ravage new sales, destroying the long 'tail'. Retailers already take a big cut of the retail price for new games, meaning with all these factors considered, break-even can occur at 1.5m units without online (which can already halve the break-even level).

So few would argue against the fact that our model is broken, but we have an opportunity to change it. The upfront 'cost of goods' exposure will ease as we move to online distribution, but what about the revenue streams?

> ***"Retailers are prematurely killing off shrink-wrapped games by gouging most of the revenue, but 'shelf space' is much less of an issue online."***

PRODUCT PLACEMENT

Controversially, part of the problem is one of control. If you want product placement, external funding and bonding, then once development is started there must be a commitment to publish. Product placement and external funding have to be agreed long in advance, and this is not practical if a publisher insists on retaining the right to stop development; something that happens a lot in our industry. Though this desire is for understandable reasons (if there is a belief that revenues will not cover marketing and cost of goods, or if the publisher does not have the funds, or because of anticipated competition), the knock-on effects – the inability to use external funding or product placement – are often not considered.

Games are better suited for product placement and advertising than film – in games it can be done regionally and contemporaneously as the graphics are rendered on-the-fly, and since a smaller proportion of the $50m is spent on development – because of the cost of goods – it could be even more significant than in film, when you consider the same $50m game will now cost $35m up-front to develop online.

Online offers us many other options too. We should think creatively about whether we might have an equivalent to the box office. For much-anticipated games perhaps an exclusive online-only premium (charged by time) multiplayer play could be made available before the full release of the game? Building a game over time, starting with the minimal playable is perhaps another way of doing this – as already happens online in the 'social' space.

We have an opportunity to shape expectations for big budget games online. Yes, retailers are prematurely killing off shrink-wrapped games by gouging most of the revenue, but 'shelf space' is much less of an issue online, so the long tail becomes more viable even without these changes.

With these changes, the $50m game makes a lot more sense. So the $50m game is not dead, but perhaps it is taking a nap. Roll on online.

David Braben is the founder of Cambridge-based Frontier Developments. Best known as the co-creator of *Elite*, Braben has contributed to, designed or overseen a number of other projects including *Frontier: Elite II*, *Dog's Life*, *Thrillville* and *LostWinds*. Frontier is currently developing his next title, *The Outsider*. He is also closely involved with Skillset.
www.frontier.co.uk

//COMMENT: LAW

Open Source?

by **Tatiana Kruse**, Games Investor Consulting

EasyJet's airline reservation system faced a legal proceeding that drew light on the tricky issue of software rights

CAN COPYRIGHT in computer programs be infringed by non-literal copying?

Copyright protects the form in which ideas are expressed; not the ideas themselves. Literal copying of source code without authorisation will be copyright infringement. But the English courts have been reluctant to protect the functionality of computer programs, on the basis that functionality falls on the wrong side of the expression/ideas dichotomy.

The question of infringement of a computer program by non-literal copying has again been considered in SAS Institute Inc v World Programming Limited (2010). SAS Institute developed financial software which performed statistical analysis. The software's core component enabled users to write applications or scripts in a programming language devised by SAS, which would then be run on the SAS programs which those users would have to license from SAS.

The defendant acquired a licence for SAS's software and studied it. The defendant had no access to the source code of the SAS software; nor had it decompiled it. The defendant developed its own programs, which were intended to emulate the functionality of the claimant's programs, and could be used to execute applications written with the claimant's core software. SAS Institute claimed that the defendant had infringed its copyrights by – among other things – indirectly copying the SAS programs by copying the SAS manuals; and breaching the terms of the SAS licence.

SYNTAX AND PUNISHMENT

Justice Arnold's preferred view was that copyright in computer programs did not protect the SAS programming language, data files (which he found were interfaces), or functions. He agreed with the decision in Navitaire v EasyJet (2004), that there was no infringement by copying of the functions of airline reservation software, where there was no internal similarity; or by copying the syntax of commands, screen displays and reports, or business logic.

> ***"One wonders if there might be more specific aspects of gameplay which could fall on the protected side of the expression/ideas dichotomy."***

However, the Justice referred certain questions to the CJEU, since the law on the protection of UK copyright is based on the EU Software Directive (Note that Justice Arnold represented the defendants in the Navitaire case).

In broad terms, the questions are:

- Does the Software Directive mean that copyright in a computer program is not infringed by:
- Replicating its functions, where there is no access to source code and no decompilation? Is the answer affected by the nature/extent of that program's functionality; the skill, judgment and labour expended on devising the functionality; the level of detail reproduced; or whether what is reproduced goes beyond strictly what was needed for the same functionality?
- Writing a second program so as to interpret and execute applications using the same words and syntax as used by the programming language of the first program?
- Writing a second program so as to read from and write to data files in same format as devised for that first program?
- Does it make any difference to the answers, that the author of the second program has studied the first program or related manual?

CARBON COPIES

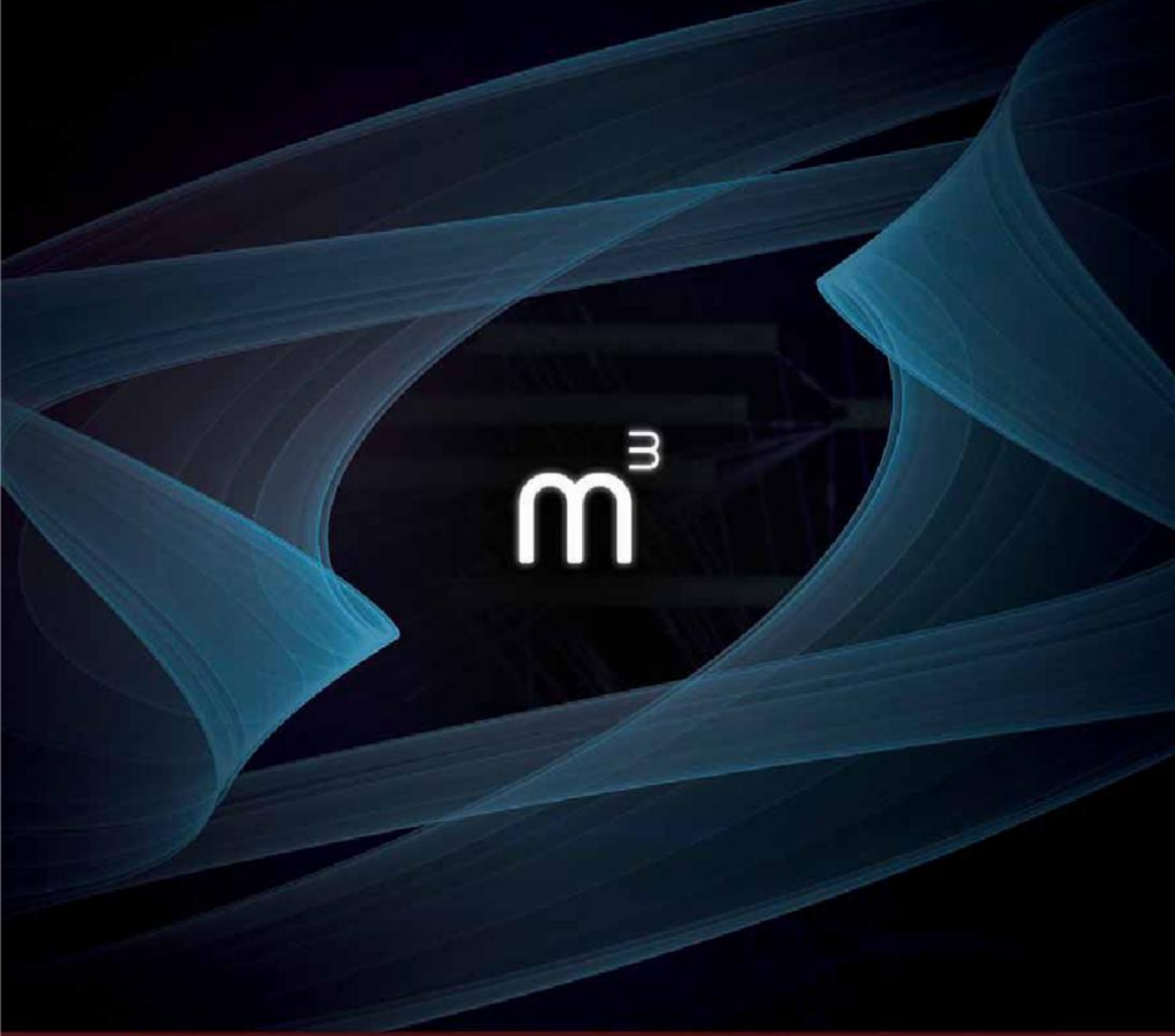
What is the scope of the statutory permission to observe, study or test the functioning of a computer program (relevant to the breach of licence claim)?

In cases concerning the non-literal copying of financial or business software, it may be difficult to conceive of non-literal copying other than of ideas or pure functions. What about games? Nova Productions Ltd v Mazooma Games Ltd (2007) concerned a claim for copyright infringement of a computer game simulating pool.

There, the court stated that if the 'idea' is sufficiently detailed, so that the author's skill and labour is in the expression of that idea, then infringement is possible. In the particular case, the court found, with regard to textual copying of the program, that the similarities between the parties' games were at such a level of abstraction that there could not be infringement.

One wonders, however, if there might be more specific aspects of gameplay which could fall on the protected side of the expression/ideas dichotomy; say, a particular way of handling a weapon. Note that the above cases were concerned with program copying. The copyright and protection of the artworks in games is a different story.

Tatiana Kruse, of international law firm Salans LLP, is specialised in IP and IT law and has a particular interest computer games. She can be contacted on +44 (0)20 7509 6134.
tkruse@salans.com



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EDINBURGH INTERACTIVE

A look ahead to some action north of the boarder for Edinburgh Interactive 2011...

People can definitely expect something different from this year's Edinburgh Interactive. We have a totally new style of venue in probably the best location in Edinburgh, but it's a secret at the moment," says Edinburgh Interactive event director Alexa Turness of the August 2011 show taking place in the Scottish capital.

"The whole tone of the conference will be slightly different for this year, focusing not just on video games but the broader industries relating to the whole of Interactive Entertainment," she explains.

"We will of course discuss social networking, cross-platform and mobile gaming but we will also touch on TV, film, music, technology, digital media and marketing."

In order to maintain the event's relevance, there will also be a focus on one of the biggest issues currently facing the games industry.

"In light of the *Livingstone-Hope Skills Review*, we will be creating a programme of talks, available free of charge to the public, to promote the ways in which people can get into the industry," Turness (*pictured, right*) says.

"We want to create awareness amongst parents, teachers, students and children and show people the fantastic opportunities there are out there for the taking"

Executive director of Redbedlam and Edinburgh Interactive committee member Fred Hasson (*pictured, below right*) picks up on what has made the Scottish conference such a respected event since its first run back in 2003.

"The secret of the event is it never got too big, we have a maximum of 300 to 350 attendees," he explains.

"Its informal structure also lets delegates feel part of the crowd, however senior or junior you are in the industry. We also always manage to keep ahead of the game in terms

THE MONTH AHEAD

A look at what April has in store for the industry and beyond…

APRIL 1st:
April Fools' Day. Accurate and honest journalism is likely across all media until the stroke of midday.

APRIL 8th:
Dynasty Warriors 7 is released. The fascinating and beguiling history of China is again revisited through the genre of hack-and-slash.

APRIL 13th:
East Coast Game Conference. The annual event for all industry professionals on the East Coast of the United States is heading to North Carolina.

APRIL 15th:
Michael Jackson: The Experience is released across new platforms. Now everyone can pretend they know how to moonwalk.

APRIL 21st:
Portal 2 goes public. The epic battle between human and machine for a slice of the ever-promised cake continues.

APRIL 21st:
Opertaion Flashpoint: Red River is out. Why shoot your enemies personally when you can call in an airstrike anyway?

APRIL 22nd:
Good Friday. Another April day, another day off. Some months just seem to have that special certain something.

APRIL 23rd:
St George's Day. Get ready for another exciting year of confused half-mumblings as everyone tries to be just the right amount of patriotic.

APRIL 25th:
Easter Monday. Chocolate, chocolate, chocolate, etc. Time to it down in front of the telly and complain that it isn't as good as it used to be.

APRIL 28th:
Festival of Games 2011. The Netherlands-based games industry conference, expo and meetings match-maker event is fast becoming a must-attend occasion.

APRIL 29th:
The Royal Wedding. Hey it's yet another day off, who's complaining? Just don't turn the telly on.

of trends. In the early years of the event we were talking about the potential of online content when everyone else was still talking about the next generation of consoles.

"This year we have [Chinese online services giant] Tencent, whom we're surprised not too many people are aware of yet."

The way in which the event has done its business has, through need, had to change considerably over the years. Hasson, however, remains positive that it has retained its relevance through ongoing difficult industry circumstances.

"The original event in 2003 had a plush venue, a full time organiser and plenty of sponsorship, but now our budget is 20 per cent of what it was then if we're lucky," he says.

"In those days though, there were meetings the whole year round and there was quite a lot of industry politics and the like."

"Today things feel more like what they should be. It's become a group of people working together more or less for free to put something on for the love of it. It has become for the love of the industry and what it represents, and it is that culture that has made this one of the longest-lasting events of the games calendar in the UK."

And it is this course that Hasson sees as the one which will be taken for Edinburgh Interactive at the dawn of a new decade. "The 'land of plenty' times are over and we've cut our cloth accordingly as an organisation," he says.

"We continue to be ahead of the times with the themes and the content, and we are still altruistically doing something for the greater good of the industry which is connecting with the outside rather than all the more self-congratulatory back-patting that can go on the rest of the year."

www.edinburghinteractive.co.uk

DEVELOP DIARY

Your complete games development event calendar for the months ahead…

nordicgame
MALMÖ, 10-13 MAY 2011

NORDIC GAME 2011
May 10th to 13th
Malmö, Sweden
www.nordicgame.com

The eighth annual Nordic Game conference will be held in May at the Slagthuset building in Malmö, south Sweden.

Continuing its traditional focus on bridging gaps in the industry, the 2011 event will seek to utilise the themes of creativity and entreprenurship in games.

The conference is open to participants from across the Nordic region, as well as Europe, North America and Asia.

With more than 1,500 expected attendees and a wide variety of presentations, summits and network opportunities, the Nordic Game conference is one of the largest events of its kind in Europe.

APRIL 2011

MCV INDUSTRY EXCELLENCE AWARDS 2011
April 7th
The Brewery, London, UK
www.mcvuk.com

FESTIVAL OF GAMES 2011
April 28th to 29th
Utrecht, The Netherlands
www.festivalofgames.nl

MAY 2011

NORDIC GAME 2011
May 10th to 13th
Malmo, Sweden
www.nordicgame.com

THE DEVELOP QUIZ
May 11th
Sway Bar, London, UK
www.develop-online.net

CANADIAN GAMES CONFERENCE
May 19th to 20th
Vancouver, Canada
canadiangamesconference.com

MONETISING MOBILE
May 25th
BAFTA, London, UK
www.mobile-ent.biz

MCM LONDON EXPO
May 27th
Excel, London, UK
www.londonexpo.com

JUNE 2011

E3 EXPO 2011
June 7th to 9th
Los Angeles, US
www.e3expo.com

JULY 2011

MCV GAMESFIVES
July 1st
London, UK
www.gamesfives360.co.uk

DEVELOP CONFERENCE
July 19th to 21st
Brighton, UK
www.develop-conference.com

DEVELOP AWARDS
July 20th
Brighton, UK
www.develop-online.net

AUGUST 2011

EDINBURGH INTERACTIVE ENTERTAINMENT FESTIVAL
August 11th to 12th
Edinburgh, Scotland
www.edinburghfestival.co.uk

GDC EUROPE
August 16th to 18th
Cologne, Germany
www.gdceurope.com

GAMESCOM 2011
August 17th to 21st
Cologne, Germany
www.gamescom-cologne.com

SEPTEMBER 2011

EUROGAMER EXPO 2011
September 22nd to 25th
Earl's Court, London, UK
expo.eurogamer.net

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Intel AppUp℠ developer program

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The Internet has truly simplified so many things we do and software distribution is no exception. It has triggered a huge increase in app stores that help consumers find the apps they are looking for and apps that deliver new experiences. The Intel AppUp℠ center is one such store. It is currently available for netbooks and going forward for tablets, smartphones, consumer electronics, Smart TV and more.

The Intel AppUp center

The Intel AppUp center – Intel's app store – is designed to take advantage of the growing number of devices – both today and into the future.

- The Intel AppUp center is a one-stop hub for finding, choosing, downloading, and managing applications for netbooks and PCs; validated and scanned by Intel for known malware, viruses and spyware before being added to the AppUp center
- Consumers no longer need to spend hours searching the web when they'll find many of the best applications – created only by members of the Intel AppUp developer program – right inside the Intel AppUp center

The Intel AppUp center vision is to expand to just about every device out there. It is an app store that unifies, rather than splinters, making life easy for consumers – and developers.

The Intel AppUp developer program

For developers, the Intel AppUp℠ developer program provides products and resources for developers to create great experiences across a continuum of devices. The program presents everything a developer needs to make money and sell apps for a wide range of devices.

It delivers a choice of operating systems, runtimes and devices so developers can code using languages and tools they are comfortable with. The program also furnishes easy-to-use tools and easy validation processes.

- Alongside C/C++, the program also supports Microsoft.NET*, Java*, MeeGo* and Adobe's AIR* runtime, with others to come in the future.
- There is only a small learning curve and coding effort required. You can use languages and tools you are already comfortable with. SDKs are made up of a few lines of code and provide APIs for authorization and licensing.
- The Intel AppUp developer program SDK also provides many other benefits including authorisation, crash reporting and a consumer store client emulator for testing. All SDKs also come with IDE plug-ins to help develop and monitor apps.
- If your app is not written in a supported language, wrapper solutions allow you to use one of AppUp's natively supported languages as a layer in your application while your apps run in their native environment. Essentially, you can develop your apps using the languages, tools and runtimes that best suit your app needs.
- The program also provides developers with comprehensive porting guides, case studies, tips and tricks – and porting tools – which provide an excellent opportunity for developers to join a new far-reaching ecosystem.
- Furthermore, there's already an existing and enthusiastic community of fellow developers who can provide excellent feedback and support for those new to the Intel AppUp developer progam.
- Intel AppUp developer program provides developers with a potential market of 70 million plus devices and emerging markets for tablet PCs and other devices. A strong ecosystem of partners and retailers already exists, providing great distribution opportunities, which is only going to grow.

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The Intel AppUp℠ developer program has a devastatingly simple and effective model to getting your apps in front of consumers – "partner with those who provide global exposure."

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Making money

We understand that developers want to be creative, but you want to make money too, right?

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BETA

DEVELOPMENT FEATURES, INTERVIEWS, ESSAYS & MORE

"Quite a few of us meet up regularly for drinks and dinner."
Torsten Reil, NaturalMotion, p44

The motion capture sector in-depth

p23

Interview: The fall and rise of Crytek UK

p36

How to win a Develop Award

p38

Here's looking at you

MotionScan has stunned many with its detailed facial animation in L.A. Noire. Develop investigates, pages 18 - 21

A view to a kill

The prospect of a truly adult thriller built around character interaction is generating a lot of excitement. **Stuart Richardson** speaks to Team Bondi and Depth Analysis to find out how facial animation technology built a gameplay mechanic in Rockstar's L.A. Noire…

In the early years of the cinema – back before Spielberg, Lucas and Cameron *et al* shunned the medium's more literary leanings and defined the 'big' film – character was everything.

The curl of a lip, the raise of an eyebrow, a word unspoken; little asides spoke volumes about the motivations of the tormented souls of the silver screen. The genesis of special effects offered writers and directors a far grander canvas on which they could create, but with the possibility of near-limitless scope, a certain nuance got lost in the mix.

For cinema, better technology has frequently had a negative effect on the power of human performances.

As if to highlight differences between two mediums, *L.A. Noire* will hit shelves across the world next month. A deliberate reflection of the film noir movement of the 1940s and 50s, the game's advertising has proudly boasted of its interrogation gameplay mechanic in which gamers must decide how true the stories NPCs tell them really are. The game features cutting edge facial animation captured on a massive 3D rig in a process dubbed MotionScan by Depth Analysis, a services firm that emerged from within the game's developer Team Bondi in 2005. *L.A. Noire* wants to prove that in video games, better technology *creates* better characters.

"From the outset when we began developing *L.A. Noire*, we knew that the key moments in a detective game would be the interrogation of the game's main suspects," explains Brendan McNamara, founder of both Depth Analysis and Team Bondi, and studio head of the latter.

> ***"We sit the actors in a chair with 32 cameras around it. It's kind of like doing a constant close-up, and the whole performance is done in one go."***
>
> Oliver Bao, Depth Analysis

"We wanted to ensure that each interrogation was compelling and a core component of the gameplay, and that each suspect spoken to was positioned to give or withhold information. Having worked with existing motion capture and automated phoneme systems in the past, we knew that we wouldn't be able to achieve the degree of subtlety that we would need to read each character's facial expressions."

Depth Analysis head of research Oliver Bao expands on the process that the company created to address that balance.

"We sit the actors in a chair with 32 cameras around it," he says. "It's kind-of like doing a constant close-up, and the videos are captured in-sync. We capture the audio and body positioning at the same time with body markers so the whole performance is done in one go."

"The 32 cameras organise into stereo pairs, so each pair works as a 3D scanner. Each take allows you to scan a patch of the head, and then by merging the 16 patches together you get a full 3D head model.

"We do quite a bit of filtering to make sure that it looks temporally smooth, and we also do quite a bit of compressing down to make sure that it fits onto our game disk. That's quite a challenge considering that the video data rate that we get before compression is one gigabyte per second and we compress that down to one kilobyte per second for running in-game."

McNamara is left in no doubt as to the effectiveness of the process, and the role it played in creating the living world of 1940s Los Angeles in *L.A. Noire*.

"MotionScan allowed us to bring a sense of humanity to the game that has yet to be achieved up until now. As a player, we can interact with and look at each character in the eye throughout the game and essentially believe in their performances," he says.

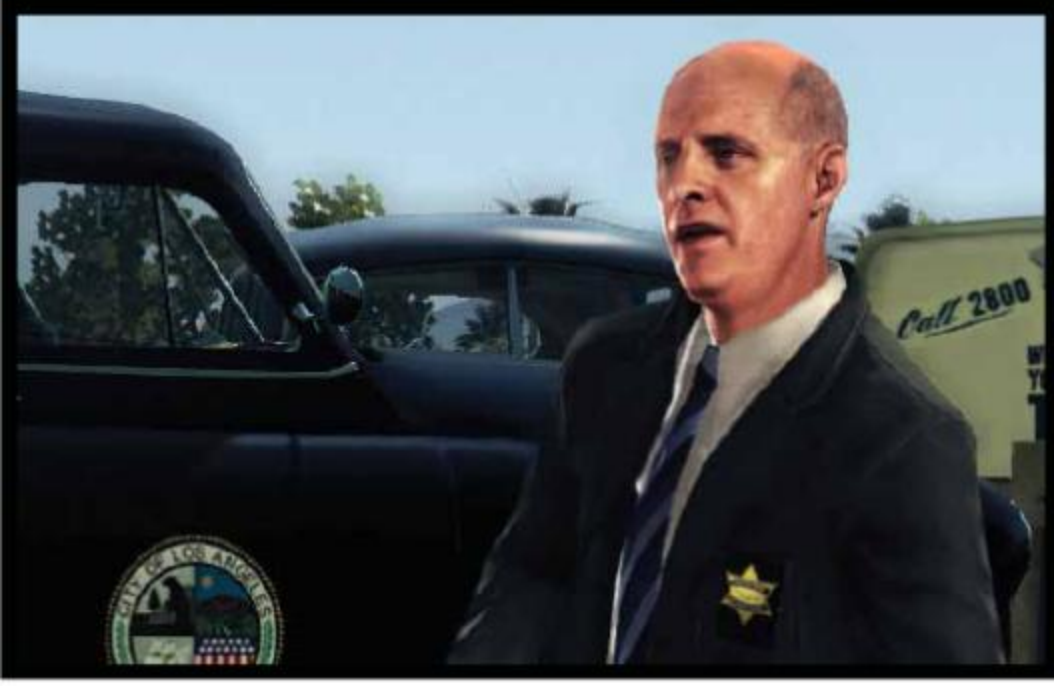
"It definitely transforms the game experience for the player. From them suspending belief that it's just pixels clubbed together to look like humans, to their experience as being as authentic as watching a TV show of a film. It's been amazing to see the transformation from disbelief to belief."

Depth Analysis' Oliver Bao and Team Bondi's Brendan McNamara

DOUBLE INDEMNITY

The process behind MotionScan is a complex one, but Bao is adamant that it takes up, if anything, less time to complete than more traditional methods of facial animation.

"We've managed to do 40-to-50 pages of script in one day. There was a client who came in to do a test shoot – they'd never used the system before and they walked



away in one day with 40 pages of script filmed," he recalls.

"As long as you get the actors to turn up, you just have to go over their lines and then you let them get on with it. In terms of processing right now we can do 20 minutes in a day. If we had more hardware we'd be able to go much quicker than that."

As efficient as the system is, however, such a fundamental overhaul of the facial animation system inevitably uses a significant amount of processing power, even with the aforementioned compressing process.

"We do have to go through a process of reassessing allocations," Bao confirms.

"Right now we can get three heads talking in parallel, so you have to optimise the rendering so that the heads are not facing the camera so that certain heads don't talk.

"The lead characters have priority so you make sure that they are covered. It actually works out quite well, so most people don't even notice that there are only three people talking at the same time."

McNamara reinforces the massive positive shift that Team Bondi hopes such new capabilities will generate, warts and all.

"It allows video game designers to think outside of the typical shoot and drive paradigm," he says.

"To challenge designers by asking 'What other types of gameplay can we develop based on human interactions?', 'Can we develop relationships with the characters?' or 'Can we make characters that people really care about?' It opens all of that up to game designers and writers.

"Players have to decide if they really want to pull the trigger on the character that they have taken the journey with, for instance. MotionScan has helped us turn polygons and pixels into something you have to think more deeply about. That's really exciting and incredibly liberating for games makers."

Bao describes the way in which he sees the MotionScan technique as having positive potential behind the scenes as well as in front of them.

"It brings a level of humanity. With traditional mocap you can't get those microexpressions and that nuance," he says.

> ***"MotionScan has helped us turn polygons into something you have to think more deeply about. That's liberating for developers."***
>
> Brendan McNamara, Team Bondi

"There are all these little things that get filtered out. With mocap you also have to do clean-up, and every time an animator touches the data then you lose a bit of that actor's personality because animators tend to use their own face as reference. The more they touch it the less realistic it becomes.

"With our system we're trying not to let anybody touch the face, so what you see is what you get."

The simultaneous development of game and technology, McNamara explains, was to ensure that the direction of the *L.A. Noire* corresponded with the growing capabilities of the MotionScan system.

"*L.A Noire* overall was relatively untested in the sense that what we were trying to make was a game that kind of reinvented the whole action adventure genre. No one had really brought this blend of genre types together before, so MotionScan was really just another part of the puzzle," he says.

"The game and the MotionScan technology were developed side by side of each other so it made it easier for us to execute. And seeing how it was coming along at each milestone was really exciting for the *L.A. Noire* team and it really informed the choices of how the dialogue, interrogations and cinematics teams designed their parts of the game."

SCARFACE

Building and using new technology in a live dev environment will always bring with it new challenges. As McNamara and Bao have it, MotionScan was no exception.

"One thing that really threw us was when we started using the technology was that we realised there was no going back on any level," McNamara explains.

"We used to include a dialogue line while in cover in a gunfight, and then at the end of that line the player's character's head would blend back to their game head and, presto, they would look like your conventional game robot. So the transition from looking really alive and kicking in the game world to being

L.A. Noire takes its visual cues from the eponymous genre of 1940s and 50s US cinema

lifeless was like switching a light switch on and off.

"That made the team consider capturing lots of 'idles'; angry, sad, proud, humble, exertion, just little sequences that we could always have on the player's face and others people's faces when you cut to them. So it has been all or nothing, because once you go down this route, you're committing to a level of realism throughout the whole game. Not just when it's convenient to do so."

Such issues, as Bao sees it, pale when compared with the positive reactions of testers to the representation of characters in *L.A. Noire* he has noted already.

> ***"People are treating it like TV episodes. They become so attached to their favourite characters that it's no longer like playing a video game to them."***
>
> Oliver Bao, Depth Analysis

"Lots of people are commenting about how good the acting is in *L.A. Noire*," he says.

"In QA we have had people saying 'I don't like this character, he's a snob. You should replace him with this actor because I think he'd do a better job.'

"People are treating it like TV. They are getting so much more into it, I've had people come up and say 'Why'd you replace that guy, he was doing such a good job', and you have to explain about script changes or actor's availability. People become so attached to their favourite characters that it's no longer like playing a video game to them."

Looking to the future of MotionScan, and what it represents for both facial animation and mocap in general, McNamara has set his sights impressively high.

"MotionScan embodies the future on a few levels. Firstly, when this technology can capture full body performances, the level of realism will be hard to differentiate between game, film and television," he says.

"That will make the gameplay experience pretty seamless from exposition to action. Secondly, for film makers it will mean they can create whole scenes from capture data on the desktop the way they currently edit films. They will be able to adjust the action, move characters, change cameras and re-light the scene until their heart's content.

"Overall, for filmmakers that's pretty exciting.

"And for games creators, it means we can compete with films and TV on a pure

storytelling and performance level, along with leveraging all of the other interactive strengths that will pave the way for more exciting games."

And as Bao describes, Depth Analysis has many commercial avenues to pursue on the back of its work on *L.A. Noire*.

"Right now there are three projects on the go," he says.

"The commercialisation of this current set-up is first, and then I'm looking at building an upgrade of the head-rig for films and commercials, which will entail getting more high-res cameras and algorithms to ensure better quality and 3D data fidelity.

"The third project is the full-body mocap, which is a completely different ballgame in which you basically use MotionScan on the whole body."

McNamara's confidence, along with the unarguable quality of the technology in MotionScan and the effect it has had on *L.A. Noire*, seem bound to lead both Depth Analysis and Team Bondi on to ever more interesting projects. The possibility for the technology to cross over into filmmaking is also another standout example of the way in which one industry, with Team Bondi and Depth Analysis at the helm, could well be leading the way for a more established one to follow behind it.

"For MotionScan the goal is to continually make it better. As I said earlier, it's still very early days and we are listening to feedback from the people who are testing the rig and pipeline," McNamara explains.

> ***"For MotionScan the goal is to continually make it better and better. It's still early days and we are listening to the people who are testing the rig and pipeline."***
>
> Brendan McNamara, Team Bondi

"We want to be able to use shaders more cleverly, take a look at subsurface scattering and also computer generated hair too, which we see a lot of our film customers are working with. We are also looking at retargeting so that you could take an actor's performance from MotionScan and apply it to various non-human characters.

"We are already doing initial research for full body capture in costume for phase two – it's exciting times for Depth Analysis and MotionScan for sure."

www.depthanalysis.com

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JAGEX

MOVING PEOPLE

From rigs to textures via mocap and facial animation, character animation is changing. **Will Freeman** talks to developers, service providers, tech companies and hardware manufactures to find out what the future holds...

As player expectations continue to rise, and static photorealism becomes a standard in triple-A gaming, the industry and public's attention is now zeroing in on character animation.

At a time when stunning footage of *L.A. Noire* has made facial animation a talking point across the industry, the onus is on character animators of all kinds to leap the uncanny valley and take gaming with them.

The democratisation of technology means numerous techniques now compete for the attention of studios large and small, from audio-driven facial animation tools to desktop motion capture solutions used for, among other things, pre-visualisation and rapid prototyping.

But what trends today are shaping the in-game characters of tomorrow, and how will approaches to motion-capture, rigging, modelling and facial animation change?

HIGH FIDELITY

"The biggest development is getting a high enough fidelity on in-game characters to where nothing hinders an animator, whether that person is using performance capture or keyframing," says Epic's lead animator Jay Hosfelt, who is quick to highlight that performance capture is an approach that offers both pros and cons. "Performance capture will always need the final touches of an animator, so it's important to have a pipeline that makes it very easy for an animator to go in and polish."

Certainly, integration of techniques seems to be important to most of those working with animated characters, and a model is emerging that sees studios harnessing multiple methods.

"The most exciting development is the tight integration of procedural animation with more traditional performance capture and key-framing," suggests Torsten Reil, CEO of run-time animation engine specialist NaturalMotion. "We're now starting to see systems that seamlessly combine the two approaches. In addition to that, we can now use animation to instruct or influence the style of procedural motion, which is extremely powerful."

> ***"The most exciting development is the integration of procedural animation with traditional performance capture and keyframing."***
>
> Torsten Reil, NaturalMotion

FORWARD THINKING

A mood of refinement, however, doesn't mean that innovation is stifled, and progress in the character animation space is still rife, most notably in Team Bondi's much-hyped 'game noir'.

"Undoubtedly the successful implementation of surface based animation by *L.A. Noire's* engine is important," says Nataska Statham, producer at art outsourcing and animation specialist Imagination Studios. "Surface animation has been used by other engines before, but always on a limited scale. Being able to achieve good compression to successfully implement it on a large scale will bring games even closer to the level of quality of pre-rendered movies."

As ever, Hollywood is one step ahead in the photorealism race, but expectations are that within the next generation of consoles real-time support for the likes of muscle deformation, less expensive cloth deformation, and of more support for blendshapes and surface animation will become standard.

Another trend defining the future of character animation is one that sees the specialty cross paths with artificial intelligence, and already tool companies are gearing up to support such a convergence.

"One of the most interesting areas out there is creating characters that interact believably and navigate with their environment," states Havok's head of product management Andrew Bowell.

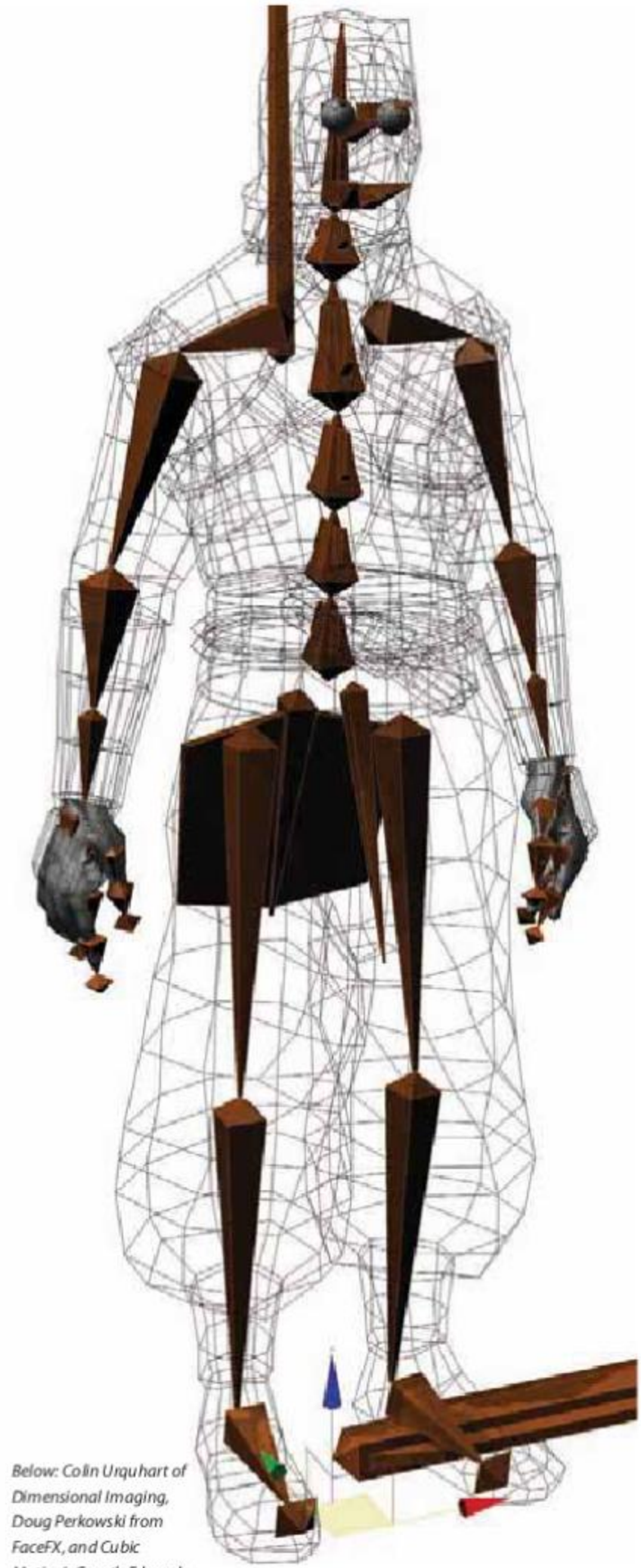
"We see a lot of cool problems when it comes to informing and responding to a pathfinder based on a character's animation set. This only gets more challenging when you start working with dynamic environments and multiple characters."

STEP OUTSIDE

Elsewhere, even 'traditional' optical mocap is changing, as actors and artists are beginning to escape the confines of the studio. "The

Left to right: Ikinema's Alexandre Pechev, Havok's Andrew Bowell, Side's Andy Emery, and Chris Waller of Creative Assembly

CHARACTER BUILDING: SKELETON



Below: Colin Urquhart of Dimensional Imaging, Doug Perkowski from FaceFX, and Cubic Motion's Gareth Edwards

recent development of shooting performance capture outdoors is particularly exciting for me," reveals Ninja Theory's visual art director Stuart Adcock. "Not only is it good for the soul to be outdoors rather than in a dark room, but it also opens up the opportunity for actors to perform within the context of an outdoor environment."

An example of the benefits of exterior mocap work would be actors performing whilst squinting in the sun for a game scene set in bright daylight, where a developer could set our star's position in game to maximise realism.

The trends sculpting in-game characters today, however, are not all positive. Developers are already striving to implement new technologies and techniques on five-year-old platforms, meaning hardware and engine limitations are significantly downsizing what can be implemented in games. And the rush to keep up with progress doesn't only falter on platforms.

"We are at an odd plateau right now where the technology is ahead of our understanding of it," says Imagination's Statham. "It will take some time before the animators and art directors catch up with the full potential that techniques such as performance capture have to offer."

PERFORMING ARTS

Developers aren't the only ones suffering as a result of industry pace. All too often, some suggest, mocap performers are still not given time to prepare for their roles, spend time with the director and fully understand the vision of the game.

"Lack of rehearsal time is a killer," insists Audiomotion's Mick Morris. "If the performer knows his lines he can then use this as a base from which to improvise or play with different aspects of his character. However, if the studio time is eaten up by fudging lines due to lack of preparation then the director is going to have a hard time getting that outstanding performance."

Morris certainly isn't alone in advocating a more methodical approach to character animation, and over at Cubic Motion taking time to prepare for motion capture work is a matter of principle.

"We custom build every solution based around the client's character rigs," confirms the company's director Gareth Edwards. "This means we choose to invest several days of set-up time to build a very customised 'solver' for every rig before we begin to start producing animation."

This set-up follows a strict protocol which Cubic Motion developed specifically with project scaling in mind, and is conducted by the art team and the technology team working in unison.

"The extra effort pays great dividends down the line, because it allows us to then produce very large amounts of animation cost effectively."

Fortunately for Edwards and his contemporaries, across the huge pool of developers specialising in character animation, there has been a move to embracing a more measured approach to progress: "What's great for us is we are seeing much longer periods of preproduction. Clients are taking longer to plan for their performance capture," says Morris. "There's a willingness to embrace both writers and directors who have amazing experience in narrative, in direction and in storytelling. Time invested in casting, finding the right director and planning properly for sessions is time truly well spent."

Indeed, the preparation that led to the shooting of the infamous and remarkably striking Dead Island trailer not once but twice is testament to the benefits of pre-visualisation and planning.

STRIKE A BALANCE

Looking to the future, specifically considering the realm of motion capture and body animation, optimism absolutely abounds. Several companies delivering distinct techniques are predictably convinced that their offering has the potential to reshape the entire discipline.

There is a growing sentiment that as mocap is increasingly used by animators as a key animation tool, the industry needs to strike a balance between cost, capture time, ease of use and what Stuart Brown, lead animator at inertial capture specialist Animazoo, highlights as the most important factor – quality of data.

> ***"There's a willingness to embrace both writers and directors who have amazing experience in narrative, in direction and in storytelling."***
>
> Mick Morris, Audiomotion

"Optical [mocap] has been the weapon of choice for a number of years in the animation industry but as inertial systems and pipelines get increasingly easy to use and cost effective we'll definitely see the playing field open up as animators have a lot more choice when they choose their motion capture tools."

Elsewhere, inverse kinematics specialist IKinema is convinced a move to procedurally generated animation during gameplay is set to emerge.

"The biggest challenge, in my opinion, is in how to provide an input to the artist in this process," adds IKinema's CEO Alexandre Pechev. "The animator must and will play a central role in this by specifying the behaviour and 'constraining' the motion. This would inevitably resort to using new tools and environments."

Another trend dominating character animation is certainly the rise of solutions, techniques and services aimed specifically at more convincing facial expression.

Titles like *Uncharted 2* and *Heavenly Sword* have placed a spotlight on key characters delivering convincing facial animation performances, and consumers are lapping up the results whilst having their expectations lifted significantly.

"As with any kind of motion capture, facial animation and lip syncing is all about the

now available in 3D

Which was the first console game to offer stereoscopic gameplay?

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3D WorldRunner

Wipeout HD

amiqus

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CHARACTER BUILDING: FACETED BASE MESH

Below: Greg Alston of Creative Assembly, Xsens' Hein Beute, and Realtime UK's Ian Jones

subtleties," says Realtime UK's CG director Ian Jones, who is keen to see the industry move on from processes that only capture an approximation of a given performance requiring the actor to exaggerate and over act in order to communicate their performance.

"The results can feel rather hammy," he says. "Even with the most extreme expressions, there are tiny details and nuances that need to be visible to really sell the emotion to the audience, otherwise the character can feel numb or dead."

The ripple from the impact of high quality facial animation is also far reaching, piling pressure on those working in disciplines previously used to dealing with less convincing character realism.

"As the mocap fidelity of an actor's performance increases, so does the emphasis on the quality of an actor's performance and the material they are provided," says James Comstock, VP of engineering and production at Captive Motion. "Since we can now achieve such high fidelity with facial mocap, a great script and performance by an actor will make your scene shine while cheesy dialogue and a bad performance will make you cringe."

SOWING THE SEEDS

That seed change has meant an increased focus on performance, with companies like Side leading the charge.

"We work with a number of different providers using a multitude of approaches and whether that's head-mounted or marker-based facial capture, full performance capture, or a combination, they all have advantages and disadvantages," confirms Side's creative director Andy Emery, who argues that whatever the approach, ensuring the process doesn't get in way of the performance is paramount. After all, it's the performance which generates the character in character animation.

"For us, the key is casting and direction," he adds. "We use fully filmed auditions and sometimes even cast for likeness. We want the best actors for the job and then we make sure we use professional directors to get the performance required."

Of course, not every project has the budget – or even the need – for facial capture, meaning other, less data heavy solutions flourish, with audio-driven technology being a prime example.

Projects that require translating or dubbing into multiple different languages, for example, need a solution that won't require multilingual performances under the costly glare of a full mocap studio. In instances like these, where a sound recording serves as the lowest common denominator, quick, affordable and scaleable audio-driven solutions like that provided by FaceFX shine.

Speaking with the FaceFX team, another trend becomes clear; something very exciting, and only possible as facial animation becomes convincing and practical without blowing the budget.

"In our real lives what we do is interact through facial expressions. If we can't simulate that, then there's a large percentage of life that games can't be based on or tap into," says FaceFX's CEO and co-founder Doug Perkowski.

"Facial animation is key because the extent to which we can simulate human interaction realistically means we can create gameplay and interactions built around those interactions and make them fun."

> ***"For the first time we have a form of entertainment where we can truly be the protagonist of our own story."***
>
> Nataska Statham, Imagination Studios

Is an intriguing idea, and one almost within the public's grasp as *L.A. Noire* introduces reading faces as a gameplay mechanic. But Perkowski is already looking forward, and is filled with ideas about how players will soon be able to assume control of facial expressions in-game. And he's not alone.

"With new peripherals for games like Kinect, we now open an even wider door of possibilities," suggests Statham. "For the first time we have a form of entertainment where we can truly be the protagonist of our own

BODY LANGUAGE

A key trend in the facial animation space is that of integration and full performance capture. As the bar for facial animation rises, it will be important for productions to understand how to leverage simultaneous facial, body, and audio capture in order to achieve greater fidelity and cost reductions.

"While those may seem like contradictory results, we believe that the use of full-performance capture should lead to reduced costs as the integration of facial and body mocap can be done with fewer resources and in less time," says James Comstock, VP of engineering and production at Captive Motion.

"Performance capture – capturing the body, the face and recording the audio at the same time – is still a huge challenge, there's not many places that actually do this," adds Greg Alston, lead animator at *Total War* studio Creative Assembly.

"Most approach it by capturing the body and the face separately and stitch the two together. It's a method we are currently looking into and from the few tests we have done, the results certainly seemed to work remarkably well."

Capturing every element of a performance in one go is certainly the most desirably route for developers, but currently the cost to do so can be prohibitively high.

"That's why a lot of people are opting to capture the performances in passes, as it's easier to manage at each stage and you can concentrate purely on the area being captured," explains Alston.

In short, true performance capture is still a complex affair, but the cost to entry is typically falling.

"Should I Invest in Motion Capture?"

Here are the **secrets** to buying motion capture systems, that mocap manufacturers don't want you to know...

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As the cost of computer technology and components has fallen, so has the cost of motion capture technology. Despite these cost reductions very few manufacturers are willing to pass the reductions along. This is because there are very few manufacturers of motion capture systems and price can be dictated by supply and demand.

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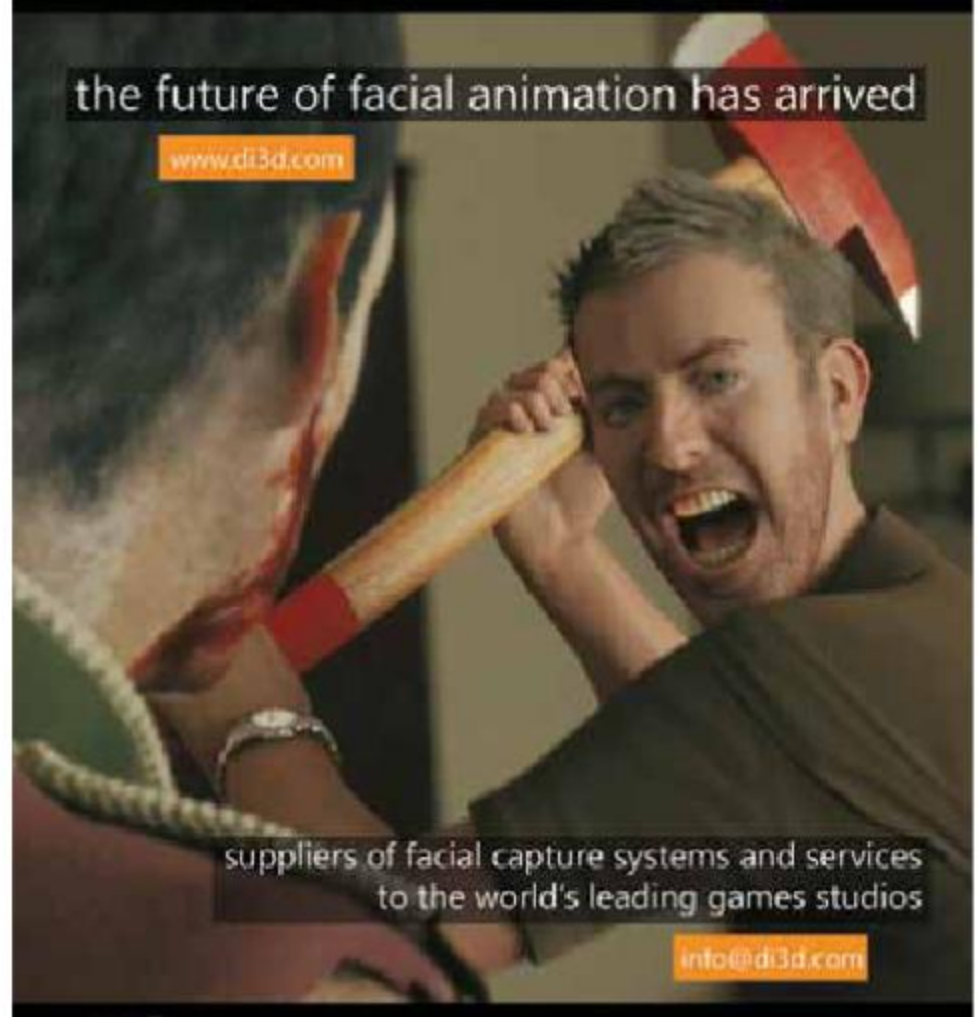

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CHARACTER BUILDING: WORKING MODEL

Below: James Comstock of Captive Motion, Jay Hosfelt from Epic, and NaturalPoint's Jim Richardson

story, not only in our imagination, but with an actual sensory response."

Fully immersing the player inside the game environment has certainly captivated the consumer, meaning an interesting phase of technological evolution lays ahead of us. That's all well and good, but what of the increasing complexity of character animation workflows as studios try to convey the subtlety required to deliver convincing performances?

"More and more use is being made of advanced graphics techniques such as per-frame normal and texture maps," states Dr Colin Urquhart, CEO of Dimensional Imaging, which uses 3D scanning technology to as a facial animation technique. "However, the question is how to generate this type of data in a way that remains cost effective for video game projects?"

It's an important question, and one the industry must address as the gap between technological progress and affordability widens. Still, there is a school of thought that suggests that in fact, character animation is becoming both more affordable, and more accessible, as more studios and industry's embrace the technology (*see 'One For All' box out*).

SPOILT FOR CHOICE

With that accessibility comes competition; a race between the various service and tech companies trying to woo studios looking to breathe life into their characters.

Choosing the right technique, or the right combination of techniques, is remarkably important, as Adcock points out: "There are now lots of different methods of making characters look very real, with advances in scanning actors and in modelling skin, so we're really under pressure to match the lifelike looks with lifelike movement, expression and speech."

All of the emotional engagement that companies like Ninja Theory attempt to build with the player can be lost in an instance if, for example, a limb moves in an unnatural, unbelievable way, or the expression on the characters face doesn't quite match what they're saying. Getting it right is vital.

"In our games we combine hand-animated movements with those driven by performance capture, so our challenge is to seamlessly merge the two together in a realistic way," confirms Ninja Theory's Adcock.

"We prefer to utilise optical markers on the face for full performance capture," offers Morris, who advocates adopting a traditional filmmaking methodology with a camera crew, sound crew, technicians and the director on set. "Shooting on a soundstage recording full body, fingers, faces and final audio is the most effective way to capture all of the elements of a good performance.

"The actors are free to move around un-tethered on the stage – unhindered by the technology, free to get into character and focus on what they were hired to do: give a truly believable performance."

Facial animation outfit Image Metrics is also an advocate of the importance of the actor's performance.

"The key driving factor to successful performance capture or character animation is simply one thing; performance," claims VP of product management Nick Ramsay, who asserts that whether performance is derived by an actor or defined by an animator, no technology can completely replace the need for performance in creating convincing and believable animation.

"Our tool Faceware perfectly utilises both the performance of an actor and the skilled hand of an animator to effortlessly produce highly believable facial animation driven by performance capture, allowing artists to have as much creative input into the final result as is needed."

Elsewhere mocap outfit Animazoo is – of course – an advocate of its own inertial motion capture system. "Inertial systems are portable and easy to use in their design," states lead animator Brown. "This means that you can mocap in pretty much in any environment, without the need for perfect lighting and dozens of optical sensor cameras – and there isn't such a steep learning curve."

This flexibility has been conceived so that animators can make and direct their own animations, without having to rely on optical system experts.

> ***"There are lots of methods of making characters look very real, so we're under pressure to match the lifelike looks with lifelike movement."***
>
> Stuart Adcock, Ninja Theory

"Also, inertial systems do not suffer from inherent problems such as marker swapping and occlusion – when the optical systems loose track of the body markers. Then there's skin artefact. The list goes on."

THE FABRIC OF LIFE

So far the emphasis here has been on capturing and animating the movements that make characters in games more convincing. But what of all the other elements that prevent the illusion being broken? Rigs and skins and textures are just as important as mocap techniques, but attract far less attention.

When it comes to providing real-time cloth, Havok is one of the most prominent companies, and it sees the practice defined by two key developments in technology.

"The first is a set of in modeller tools that puts the authoring, rigging and tuning of character clothing in the hands of artists, both creative and technical," says the company's Bowell. "Ultimately adding cloth to characters dramatically enhances the visuals of the game. To that end artists play a key role in rigging and tuning cloth and need powerful tools make it look just right."

The second technical development is a highly optimised runtime to simulate the cloth in-game. Here, optimising means not only developing algorithms that leverage today's multi-core SIMD architectures, but also crafting algorithms that perform the computation cleverly, and only when needed.

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CHARACTER BUILDING: NORMAL MAPPING

Below: Mick Morris of Audiomotion, Imagination Studio's Nataska Statham, and Image Metric's Nick Ramsay

"There has been a clear progression from the movie special effects space where cloth was a purely offline process, to games, where the algorithms have been specially modified to run in a considerably smaller time slice," concludes Bowell.

A generic challenge, not directly related to cloth but one that impacts it, is that of content generation.

"Any modern character driven game has a number of options when it comes to clothing," explains Bowell. "The first option is to model the cloth as part of the character's skin and have animators animate the cloth. This option adds a considerable number of new clothing animations for each character, the number of which scales up quickly. Often what happens is only a single garment gets animated – for example a tie or a cloak – and as the animations are cyclical, the results typically don't look very realistic."

The second option is to simulate the cloth with a real-time system such as Havok Cloth. In this case once an artist has rigged up the properties of Havok Cloth, the simulation can take care of the rest.

This option means that the artist still has a lot of control over how the cloth looks and feels but the burden of creating many animations is no longer necessary.

A sizable challenge in the cloth space is to create material that looks good at all times. "The range and speed of movement that often goes on within a game can easily break the illusion, add to this that you are often not animating to a set camera, so the challenge is to make a cloth solution that can be honed, constrained and posed by animators. Creating real-world physics will only get you so far," offers Ninja Theory's Adcock.

BIG RIG

Over in the rigging space, a paradigm shift is in place that is seeing the order of process made more dynamic.

"One of the biggest issues we have with rigging is that it's traditionally a rather linear process. In the past, starting the rigging process pretty much meant the character model had to be complete," says Jones, highlighting a fact that can cause substantial problems when a client needs to change or swap out a character at the last minute. It also meant that rigging would tend to happen somewhat late on in the schedule. Things are changing, however.

"By taking advantage of proxies and wrapping techniques, we're able to work on a character's rig entirely independently from the model and then apply the model to the rig at a much later date," says Realtime UK CG director Jones. "This allows us to invest a lot more time developing and refining each rig in tandem with the characters development."

Skinning is another area where new developments are helping developers offer greater realism with better efficiency.

"One very exciting recent development has been advances in the ability to model skin interaction," suggests Adcock. "For example, when you move your chin down to your chest the skin around your body is being stretched and folded in lots of different places around your neck, chin and the upper chest. We can now model all of this, making things just that little more lifelike and much more believable."

> ***"The challenge is to make a cloth solution that can be constrained by animators. Creating real-world physics will only get you so far."***
>
> Stuart Adcock, Ninja Theory

PIPING UP

Charcater animation pipelines are also changing, responding to the consumer expectation for greater number of believable characters in-game and on-screen.

Perhaps nobody knows more about this than The Creative Assembly, whose famously busy battlefields have become a trademark of the *Total War* series.

"For *Total War*, it's imperative that we keep the pipeline and workflow as simple as possible," reveals Alston. "Because the series deals with thousands of characters on screen, we are imposed with very tight constraints on our characters, plus the breadth and depth required for the games means we are dealing with thousands of animations.

Not including cinematics, *Total War: Shogun 2* featured just under 3,000 in-game character animations. Each was created in 3ds Max, before being exported into MotionBuilder, in which the team created the animation control rig. Dependent on the character and situation, Creative Assembly then either hand keys the animation, or imports the mocap into MotionBuilder.

ONE FOR ALL

Steamrolling the various character animation technologies into one process is encouraging, but as smaller studios making low-budget games rise to prominence, the tech needs to become accessible. Happily, that is already happening.

"Motion capture is absolutely becoming more accessible" says Jim Richardson, president and CTO at mocap hardware outfit NaturalPoint. "Over the past several years, complete systems have emerged that cost less than a used car, opening the technology to a completely new audience."

3D animation tool providers have responded to this trend in kind, with companies like Autodesk showing a renewed focus on developing real-time, mocap-centric tools, as evidenced in recent versions of Maya and 3ds Max, and their upcoming release of MotionBuilder 2012.

"The combined effect of these trends is a decreasing barrier to entry into the world of motion capture for smaller studios and independent animators," says Richardson.

As the industry evolves the democratisation of mocap and character animation is becoming a reality. Soon even microstudios could reap the benefits.

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CHARACTER BUILDING: FINAL MODEL

Below: Ninja Theory's Stuart Adcock, Stuart Brown of Animazoo, and Torsetn Reil from NaturalMotion

"Keeping all the hand-keying and mocap editing in one package makes the animation process a lot more efficient for us. From MotionBuilder we import our animation data straight into the game."

It's an impressively succinct approach, and one that can still be improved, according to the company's lead character artist Chris Waller: "The more DCC applications open up to working with scripting languages, the better the flexibility in the pipeline. From my perspective, gone are the days of endless reworking and tangles of pipeline problems relying on only the software's shipped features to find a workaround."

Now artists like Waller have the flexibility to do almost anything which is required by his pipeline, and store any and all meaningful data for use in the skinning process to reuse intelligently on similar asset types.

As to the future of character animation pipelines, Creative Assembly is ever watchful. "Node-based workflows in applications such as Softimage allow bespoke skinning solutions to be prototyped and tested without soaking up programmer time, which is an exciting feature, though one we have not yet fully exploited," says Waller.

It isn't only studios that are having to focus attention on their character animation pipelines. Over on the other side, tech and service providers are having to ready their offering for the contemporary pipelines.

"Character animators don't want to be stressed with pipeline issues, it is all about the creativity for them," admits Hein Beute, product manager of inertial motion capture specialist Xsens. "The challenge for us is to make the product fit in the pipeline. If an animator has an idea in the morning, it needs to be in game by the afternoon, without too much technical issues and post processing."

LOOKING AHEAD

With so many options from rig right through to cloth, the character animation space is certainly one of the most intricate in the business. To this day new ideas and approaches abound, and as a result convergence has become a prominent buzzword in the sector.

"What works for mocap might be tricky for a keyframe animator, and vice-versa. We try to bridge the gap between rigs – and can animate pretty much anything – but any type of convergence, even in general philosophy, would be a good thing," says Edwards of the future. "The specific challenge for Cubic Motion and other specialist studios is to convince developers that letting a team of external experts take on this most demanding of jobs is nearly always a better plan than trying to put a large team together in-house."

Undoubtedly, the aforementioned convergence of methods will let game developers achieve the best results possible, and save time and money as better integration into modern workflows. It will also help the collective effort needed to pass that ubiquitous chasm over which animators and roboticists obsess; the uncanny valley.

"Film will get there first and games will not be far behind," predicts Hosfelt, who has a keen sense of which technological avenue leads most directly to the valley. "There are some new technologies that digitally scan an actor's face as he or she performs. It's essentially 3D video capture.

"If you're shooting for reality then that may be the best bet going forward. If you want to mimic reality, just record it. For now, the best CG human performances are the ones that are interpreted and filtered through an artist or animator."

The problem with this greatest of realism milestones, inevitably, is that the closer one gets to crossing the uncanny valley, the harder the task in hand becomes; a fact that makes some doubt whether such an ambitious goal is even possible.

"I am not sure that it will ever be crossed completely in that it will be possible to create purely synthetic virtual characters that are indistinguishable from a real life person," professes Urquhart.

> ***"The challenge is to make the product fit in the pipeline. If an animator has an idea in the morning, it needs to be in game by the afternoon."***
>
> Hein Beute, Xsens

Possible or not, expectation is high, and the fascination with realism is one that is not going away. "There is certainly a lot of pressure from within the industry and also from the audience to try and achieve this leap," says Statham.

"Many have come very close, especially when it comes to still images. Whether we will or not be able to cross the uncanny valley, we can certainly create lifelike characters that evoke strong empathy and emotional response from the public."

"I don't think in-game animation has come out of the uncanny valley yet," says Reil, adding: "Believable and interactive run-time animation is still an unsolved problem in most games."

Fortunately the technology to change this is becoming available, and people across the industry are becoming more experienced in authoring run-time animation as opposed to animation clips.

"What we're currently seeing is the beginning of much wider-scale adoption of new animation run-time techniques, whether it's from us or one of our competitors. This is a really exciting trend," concludes the NaturalMotion boss.

Overall, there is optimism about character animation's future, and the discipline is driving forward with incredible pace. Defined by innovation, diversification and progress, the space's challenges are largely about refinement and perfection.

Whether the industry can cross the valley or not, one thing is certain; today's video game characters are becoming remarkably lifelike, and their capacity to change the way consumers interact with games now seems an absolute certainty.

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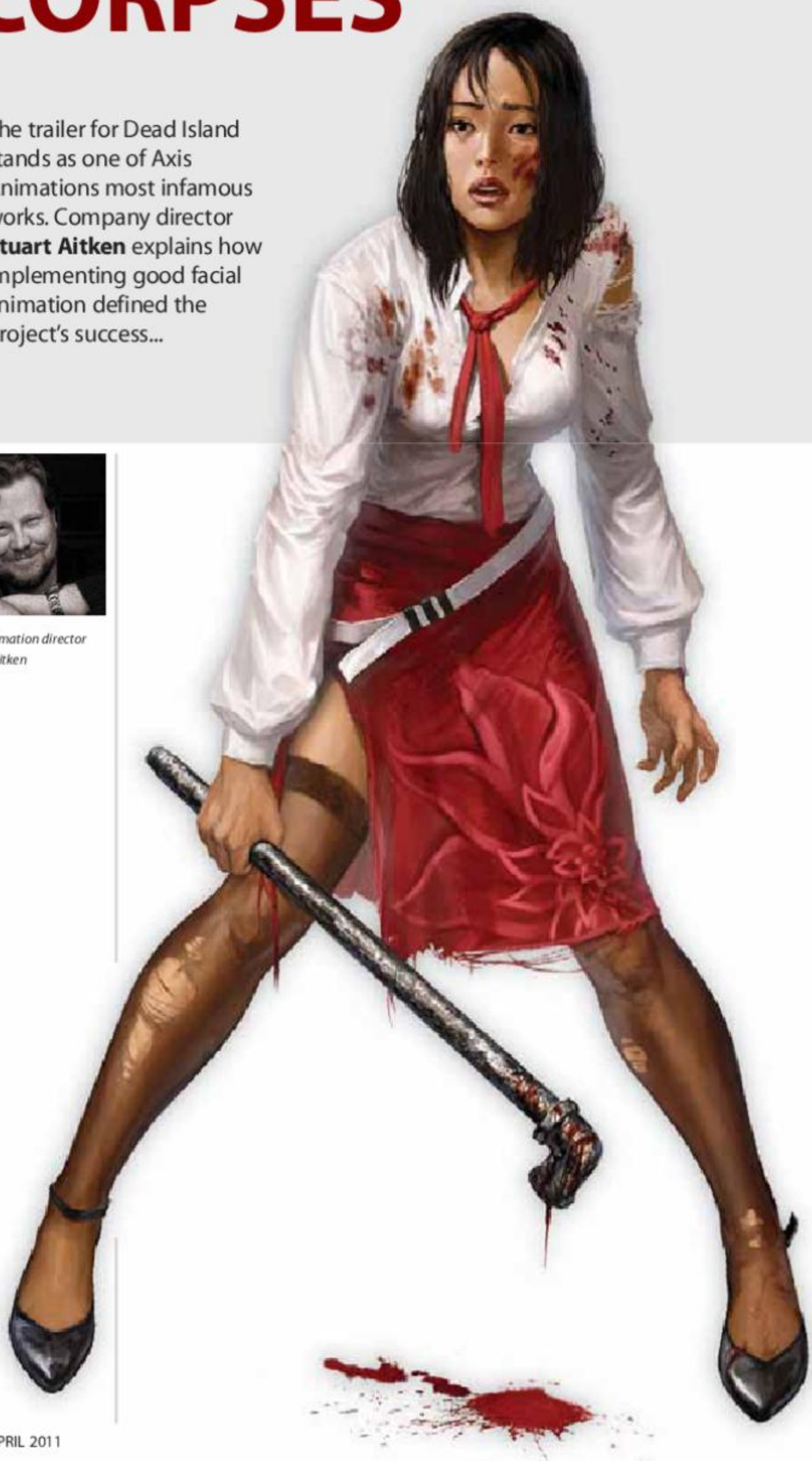
REANIMATED CORPSES

The trailer for Dead Island stands as one of Axis Animations most infamous works. Company director **Stuart Aitken** explains how implementing good facial animation defined the project's success...

Axis Animation director Stuart Aitken



Deep Silver approached Axis in the summer of 2010 to produce an announcement trailer for an upcoming game called *Dead Island*.

The trailer was to feature a family under attack by a horde of zombies, and the success of the whole piece hung on our ability to make the viewer connect with the human protagonists; to instantly empathise with them.

To really sell this the facial animation of the human characters was a primary element we had to get absolutely right, especially since the action was to be portrayed as realistically as possible.

Axis had also been in contact with Colin Urquart at Glasgow based Dimensional Imaging for several years and had followed the development of the surface capture technology it had come up with over that time with keen interest, so we spoke to them regarding the more recent advances they had made on their '4D' system (see box out).

On this job we had the luxury of being able to cast and use real actors for the parts, and since we would not have to look at any significant re-targeting – for example between an actor and a different CG character – the project seemed like it was tailor-made for direct surface capture.

FACE VALUE

That direct route was very attractive. We knew from experience that with more traditional optical facial capture pipelines trying to interpret a relatively small number of captured markers on the face as distinct poses and successfully transferring that performance to the CG characters could be difficult. It would also depend on a very highly developed pose based rig on the character side that would be capable of faithfully expressing the same range.

However we also knew there would be downsides: A pose-based rig gives you a certain amount of flexibility to animate

around any issues as it is setup in a way that is inherently animator friendly, whereas with the direct 4D surface capture route we would be literally trying to directly drive the face mesh at a much more detailed surface level, with no intermediate control rig or pose space. Essentially we would be dealing with the face animation at vertex level throughout the pipeline, which would definitely not be animator friendly – so we had to be confident that it would deliver great results with minimal 'intervention'.

> ***"The success of the whole piece hung on our ability to make the viewer connect with the protagonists – to instantly empathise with them."***

Another, perhaps more fundamental, drawback to this approach is the need to split the body and facial performances into separate sessions. Using more traditional optical capture techniques does allow these two aspects to be captured together, whereas the technology behind the 4D surface route means the actors have to be fairly static in front of the cameras used, which cover a fairly limited capture area.

In the end we relied on the actors themselves to overcome these limitations and deliver a convincing secondary performance for the facial capture sessions, drawing on the fact that they had gone through several takes of the main body capture session only hours earlier. It certainly allowed us to direct and analyse the facial performances in more detail than if we had been doing everything at once.

LIP SERVICE

We had also predicted that we would have issues with some areas of the face being occluded or hard to capture - principally the inner lips and eyelids. The former because normal human mouth movement means the inner lips are regularly occluded during lip compression and the latter because eyelashes make getting a really good depth 'read' of the eyelids from the stereo camera pairs quite difficult.

We needed to hook up an animation rig of sorts to account for final eye-line changes in the scene. Eventually we drove the eyeball movement and blinks by key-framing them from the video reference and letting the surface capture take over around the eyes.

This was implemented by creating a standard eye rig in Maya. Once animated, the character mesh would be cached out at surface level and blended into the surface capture data in Houdini. The main 4D capture data was imported into Houdini as a vertex cache (the 4D process includes outputting a coherent mesh from raw scan data) that was then converted to around 300 clusters that were used to drive the vertices' on the subdivision face mesh directly within Houdini.

For the lips we implemented some lip compression and reshaping controls in Houdini that could be both procedurally driven by the surrounding face geometry and also be hand keyed if they needed some tweaking. A related issue was that we needed to also find a way to estimate what the jaw was doing underneath the skin so we could lock the lower teeth to the jaw.

Initially the scanned heads for each actor had been done in a separate process that we felt would give us a higher resolution surface mesh than the 4D system allows, but that did lead to some issues with alignment later on (where we had to match the rest position of that geometry to the 4D data).

We subsequently discovered that using some matte stage make up on the actors' faces gave us comparative resolution from the 4D system anyway, as it removed a lot of noise – that we surmised was due to it removing most of the specular and sub surface scattering effects from the actor's skin. We decided that in future we would probably just use the 4D system for both animation and initial mesh scanning to avoid the alignment problems.

The other improvement to the process that we are working on in conjunction with Dimensional Imaging is to use and merge multiple stereo pairs of cameras to allow wider coverage of the face and remove some of the occlusion issues – this would also allow the actors a bit more freedom of movement.

www.axisanimation.com

Even in static form, the facial animation in the Dead Island trailer is remarkably convincing

SURFACE VALUE

Axis worked closely with Scottish outfit Dimensional Imaging in creating the *Dead Island* trailer. The Glasgow-based outfit is a specialist human body 3D and '4D' surface image capture and analysis solutions.

Dimensional Imaging recently introduced its groundbreaking 4D surface image capture system. It allows extremely dense 3D models to be recovered simply from stereo pairs of standard digital video camera images and, optionally, a third synchronised colour camera to capture the surface texture. The process is ideal for capturing challenging subjects such as human faces, as it is extremely fast, non-intrusive and as simple as shooting ordinary video.

Each pair of stereo frames in the sequence is processed to produce a 3D 'Range Map' which includes full depth information for every captured pixel. Using a number of technologies, including automatic tracking of landmarks through the sequence and batch processed geometry re-targeting, it is absolutely possible to recreate incredibly realistic CG facial animation from a real live performance.

The output is a fully textured mesh, plus an animated point cache which can be easily loaded into most popular 3D animation packages.

www.di3d.com

THE CRYSIS TALKS

After two years working under the Crytek UK banner, **Stuart Richardson** heads to Nottingham to find out what's changed and what's remained at the studio formerly known as Free Radical...

In 2009, Free Radical Design was in a difficult situation. Following the significant critical mauling and sales disappointment of *Haze*, the company was in an untenable financial position.

The demands of the modern industry, along with a confused perception of what makes a game successful, looked close to forcing the studio out of business.

At the eleventh hour German studio Crytek purchased the firm and Crytek UK was born. Two years on, and the recent release of *Crysis 2* marked an important milestone in the life of the 'new' studio. Having developed the game's multiplayer code, its release marks the first published work for Crytek UK since assuming its current identity. For studio MD Karl Hilton and executive producer Hasit Zala, it's an exciting time.

It has been two years since Free Radical became Crytek UK, what has changed in that time?

Hasit Zala: Well, there's been a lot of changes really. Crytek is a different company than Free Radical Design, so really what we have done is in many ways take what we had before and integrate it within the Crytek community.

Karl Hilton: Free Radical had a very strong company culture based around the excellence of our technology and our playful nature with video games. I think that we have been successful in taking that and moving it under the Crytek umbrella.

Crytek have very similar company values, and obviously they have excellent tech, so that's been an easy move for us. We've tried to make sure we've carried on the better traditions that we had at Free Radical, and we've obviously taken from Crytek. I think it's been a good learning process between the two studios and something that we worked [Crytek HQ] very closely with Frankfurt on.

The new building looks very different as well. We've tried to keep a lot of the same people – to take a bit of the best of everything you've got, but with a slightly shiner, newer surface on it.

> ***"Free Radical was quite insular. We focused on our work. We had a good time doing our job, but that was our job and that was that."***
>
> Karl Hilton, Crytek UK

Were there any major changes needed while becoming part of Crytek?

Zala: They looked at the offices that we had and decided that they wanted a new office, an environment where people could work which was of the highest calibre, so that's been really nice. Also, culturally speaking, Crytek wanted something that was in the centre of town, giving people the flexibility of either being at the gym or getting food or going out for drinks and the like. They wanted to have an environment where people felt very comfortable.

Hilton: The major difference in terms of culture was that Free Radical was quite insular. We focused on our work, we were out in a business park. We had a good time doing our job, but that was our job and that was that. Crytek have a policy of trying to bring all of that together. We moved into the middle of town so that we could say to people if you do need longer lunch times or if you need to go out after work then you can go out and do that because the whole town is just around the corner from us.

Do you operate as an arm of Crytek or are you more autonomous?

Hilton: We're a very independent studio here. We've been working very closely with Frankfurt as we were doing the multiplayer of *Crysis 2*.

Zala: It's both really. The multiplayer is very tightly knit. We're using the same code base as Frankfurt. We're very closely knit together.

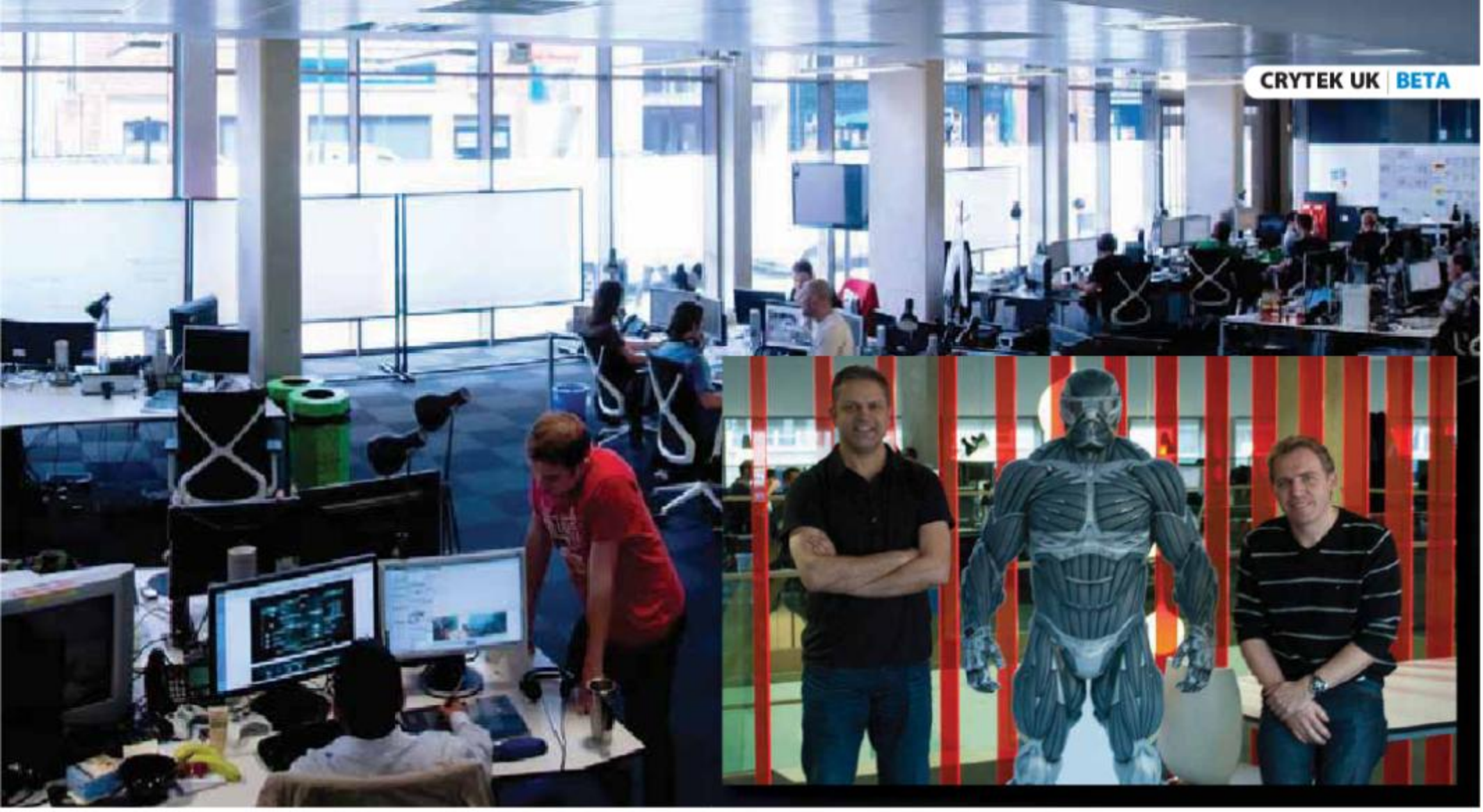
Hilton: But our model as a studio is to be strongly independent. We have all the skillsets we need, we're not dependent on any other parts of Crytek. Obviously we share the same technology, but we have all the skillsets we need and we have our own projects that we work on. We have our own, strong independent character within the Crytek group. I think they said when they first came over, you're not just a little insourcing house for Crytek, it's about adding value to the group.

How did you find working with the CryEngine on the Crysis 2 multiplayer?

Zala: It was amazing really. I think that for the staff, when they came on board, that was the thing that they were most excited about, as well as the nice new environment here.

The actual tools and technology available to us has made an enormous difference in terms of what they are able to produce from a quality perspective. The key aspect of that is the ability to iterate really quickly, you can start to construct stuff in the sandbox and then just drop into it real-time.

Especially from a multiplayer perspective, you're able to literally block out your levels and in a really quick turnaround you're able to play it, and see if the routes work and so on



and so forth. That ability to literally iterate on-the-fly means that artists are really able to hone in on the graphics, and they are able to finesse in a way we were never able to before.

Are you hoping to keep growing as time goes on?

Zala: That's something we're a little cautious about because Free Radical, before being taken over by Crytek, was a large company.

Hilton: There's an optimal size for a studio. Here we are getting up to about the 100-strong now, which is enough to make a quality triple-A title with some insourcing and outsourcing as well. That's the goal, to have one project per studio.

The UK studio does some other little bits and pieces as well, so as to whether we need to get a little bit bigger we may do, but this is the kind of comfortable size where you can get that small developer feeling in the studio, where you know everyone's name but you are still big enough to do something that is triple-A.

Everyone likes working in small teams, but we realise the need for a certain size. The heart says we want to be smaller, the head says we need to bigger. You have to find the optimal balance there.

Zala: Triple-A development means that you need to have quite large teams. There are no two ways about it. There's also the flipside where you are too big and you don't know all of your people.

There's a tipping point where all of a sudden you need twice the number of producers and so on and so forth to manage everything, and I think we are at a pretty efficient size to manage everything going on right now.

How will Crytek UK manage to thrive in the UK's rather challenged games development sector?

Zala: We think our future's very secure, Crytek as a company is doing very well. We're well funded, we've got a good track record, and so publishers are always interested to work with us. We're aware that it's a tough time however, and a lot of big companies are finding it very difficult.

Hilton: It's all about interacting with other companies, and the reputation that you have in the industry and the strength of your technology and ideas.

With the economic climate the way it is, publishers are looking very carefully at what they spend and how they spend it. So in that sense the competition is between independent developers who want to attract publisher money to them, you have to be sure about what you're offering. You have to look attractive to them and we have that at the moment, that's great.

It's a great position to be in, but you've always got to be on top of your game because there are some great studios out there who do some great work. It is really sad to see that some of that talent is falling away at the moment.

We think we've got a good offering and we've got some good relationships, a good reputation. We think we're secure.

> ***"Triple-A means that you need to have quite large teams. There's also the flipside where you are too big and you don't know all of your people."***
>
> Hasit Zala, Crytek UK

What is Crytek UK's position on UK industry Tax Breaks?

Zala: We'd love them, yes please.

Hilton: Any healthy industry shouldn't really need tax breaks.

You shouldn't be in a position where you have to use them. On a philosophical level, I don't like the idea of them at all, but clearly if other countries are doing it, we need to make sure we are working on a level playing field.

What are you supposed to do otherwise, if you can't realistically compete on the costs of development?

You have restricted amounts of money to spend, and in that situation and in the current climate we do need something to help us compete internationally.

Person for person we're as good, if not better, than any other studios abroad, but if our cost base is considerably higher here then it automatically starts to undermine things for us..

Zala: It's really sad when you see the UK gaming economy leading the way in terms of creativity and technology and general gaming standards. To see that being dissipated because a lot of the time the business is moving elsewhere, that for me is a real shame.

Hilton: There clearly is a lot of young talent heading out to Canada and you can't blame them; it's a good offer over there.

What does the future hold for Crytek UK?

Hilton: It'll be one project per studio and we have a solo project going in this studio which we are very excited about. *Crysis 2* is a springboard for the UK company to continue on to bigger and better things.

www.crytek.com

Above: Hasit Zala and Karl Hilton with an unidentified Crytek employee

DEVELOP AWARDS
COUNTDOWN TO JULY

This July the best of the best from the European development sector will descend on Brighton for the prestigious 2011 Develop Awards. Want to win one? Over the next five pages we tell you how...

// THE CATEGORIES 2011

CREATIVITY
- New IP
- New Download IP
- Use of a Licence or IP
- Visual Arts
- Audio Accomplishment
- Publishing Hero

TECHNOLOGY & SERVICES
- Technical Innovation
- Tools Provider
- Engine
- Audio Outsourcer
- Visual Outsourcer
- Services
- Recruitment Company

STUDIOS
- New Studio
- Business Development
- Micro Studio
- Handheld Studio
- Independent Studio
- In-House Studio

SPECIAL RECOGNITION
- Development Legend
- Grand Prix

// CREATIVITY

NEW IP

WHO'S ELIGIBLE?
Any UK or European studio-made IP released in the last year and first premiering as a boxed retail product which has introduced an original brand plus new gameplay aspects and/or original characters to consoles, portable devices or PC.

LAST YEAR'S WINNER
2010: *Heavy Rain* (Quantic Dream)

PREVIOUS WINNERS
2009: *LittleBigPlanet* (Media Molecule)
2008: *Lost Winds* (Frontier Developments)
2007: *MotorStorm* (Evolution/SCEE)
2006: Console IP - *Buzz!* (Relentless/Sony External Development) PC IP – *Fahrenheit* (Quantic Dream)

NEW DOWNLOAD IP

WHO'S ELIGIBLE?
Any UK or European studio-made IP released in the last year and first premiering or only available as a digital download that has introduced an original brand along with new gameplay aspects and/or original characters to consoles, portable devices or PC.

LAST YEAR'S WINNER
2010: *Angry Birds* (Rovio)

USE OF A LICENCE OR IP

WHO'S ELIGIBLE?
Any game released in the previous 12 months by a UK or European studio that is a proven quality title but is based on an external property (licensed or otherwise) not owned or created by its developer.

LAST YEAR'S WINNER
2010: *Batman: Arkham Asylum* (Rocksteady Studios)

PREVIOUS WINNERS
2009: *LEGO Batman* (Traveller's Tales)
2008: *LEGO Indiana Jones* (Traveller's Tales)
2007: *LEGO Star Wars II* (Traveller's Tales)
2006: *King Kong* (Ubisoft France)
2005: *LEGO Star Wars* (Traveller's Tales)

DIARY DATE: DEVELOP INDUSTRY EXCELLENCE AWARDS
Wednesday, July 20th, 2011. Hilton Brighton Metropole Hotel

VISUAL ARTS

WHO'S ELIGIBLE?
Any UK or European studio that has demonstrated impressive graphical and/or distinct, iconic design work in the games or gaming content it has produced and released on any format during the past year.

LAST YEAR'S WINNER
2010: *Split/Second* (Black Rock Studio)

PREVIOUS WINNERS (BEST ART & AUDIO)
2009: *LittleBigPlanet* (Media Molecule)
2008: *Grand Theft Auto IV* (Rockstar North)
2007: *Viva Piñata* (Rare)

AUDIO ACCOMPLISHMENT

WHO'S ELIGIBLE?
Any UK or European studio that has demonstrated pitch-perfect audio design, sound or music creation in its games released during the past 12 months. Use of both licensed and original tracks can also be taken into account.

LAST YEAR'S WINNER
2010: *DJ Hero* (FreeStyleGames)

PREVIOUS WINNERS
2009: *Fable II* (Lionhead Studios)
2008: *Grand Theft Auto IV* (Rockstar North)
2007: *B-Boy* (FreeStyleGames)

PUBLISHING HERO

WHO'S ELIGIBLE?
Any games publisher, developer, hardware manufacturer, platform-holder or investor – from any country – that has supported the UK and European games developers during the past year via the publishing, funding, distribution and/or co-development of new games.

LAST YEAR'S WINNER
2010: Channel 4

PREVIOUS WINNERS
2009: Apple
2008: Nintendo
2007: Sega
2006: SCEE

// TECHNOLOGY & SERVICES

TECHNICAL INNOVATION

WHO'S ELIGIBLE?
Any UK or European studio or company that has demonstrated impressive technical innovation in any aspect of games development. The award can be given to a specific technology, game or studio – provided it has been active/released as a new product in the last 12 months.

LAST YEAR'S WINNER
2010: Unity 3D (Unity Technologies)

PREVIOUS WINNERS
2009: Media Molecule (*LittleBigPlanet*)
2008: NaturalMotion/Image Metrics (*GTA IV*)
2007: Realtime Worlds *(Crackdown)*
2006: Relentless/Sony External Developments *(Buzz!)*
2005: Morpheme *(Bluetooth Biplanes)*

TOOLS PROVIDER

WHO'S ELIGIBLE?
Any company, from any country, that has released middleware or tools which have enhanced or supported the work of UK or European games development teams in the past year. Developer collaboration, new technology and industry relations are all key.

LAST YEAR'S WINNER
2010: Hansoft

PREVIOUS WINNERS
2009: Autodesk
2008: Epic Games
2007: Havok
2006: NaturalMotion
2005: Havok

ENGINE

WHO'S ELIGIBLE?
This is an award for the best third-party engines. It's open to any engine, regardless of where it is made, that has enhanced the work of UK or European games development teams in the past year. Weight is given to new versions or significant upgrades.

LAST YEAR'S WINNER
2010: Unreal Engine 3/Epic Games

PREVIOUS WINNERS
2009: Unreal Engine 3/Epic Games

AUDIO OUTSOURCER

WHO'S ELIGIBLE?
This award acknowledges businesses or individual external contractors who have helped produce, manage or directly generate audio material (music, voice recording, or VFX) for games released in the last 12 months.

LAST YEAR'S WINNER
2010: Side

PREVIOUS WINNERS
2009: Side and Sidelines (for Creative Outsourcing)
2008: Richard Jacques Studio (for Creative Outsourcing)

VISUAL OUTSOURCER

WHO'S ELIGIBLE?
This award acknowledges businesses or individual external contractors who have helped produce, manage or directly generate visual material (CG, video or assets) for games released in the last 12 months.

LAST YEAR'S WINNER
2010: Axis Animation

PREVIOUS WINNERS
2009: Side and Sidelines (for Creative Outsourcing)
2008: Richard Jacques Studio (for Creative Outsourcing)

SERVICES

WHO'S ELIGIBLE?
Any UK or European company working non-creative support and production (such as QA, localisation or customer service) that has demonstrably served the needs and demands of the UK and/or European development community during the last 12 months.

LAST YEAR'S WINNER
2010: Testology

RECRUITMENT COMPANY

WHO'S ELIGIBLE?
Any UK or European company working in the field of recruitment and human resources that has demonstrably served the needs and demands of the UK and/or European development community during the last 12 months.

LAST YEAR'S WINNER
2010: Amiqus

PREVIOUS WINNERS
2009: Amiqus
2008: OPM
2007: Datascope
2006: OPM
2005: Datascope

DIARY DATE: DEVELOP INDUSTRY EXCELLENCE AWARDS
Wednesday, July 20th, 2011. Hilton Brighton Metropole Hotel

// STUDIOS

NEW STUDIO

WHO'S ELIGIBLE?
Any new UK or European studio which has had its first game commercially released – either via retail or digital distribution – during the past year. However, companies do not need to have been founded during that period to qualify.

LAST YEAR'S WINNER
2010: Hello Games

PREVIOUS WINNERS
2009: Media Molecule
2008: Doublesix
2007: Realtime Worlds
2006: BigBig
2005: Juice Games

BUSINESS DEVELOPMENT

WHO'S ELIGIBLE?
Any UK or European studio that has, in the previous 12 months, improved its business as demonstrated by studio growth, acquisitions, investments both inward or outward, and/or steps to improve its output, efficiency or commercial performance.

LAST YEAR'S WINNER
2010: Sony XDev

PREVIOUS WINNERS
2009: Playfish
2008: Realtime Worlds
2007: Blitz

HANDHELD GAMES STUDIO

WHO'S ELIGIBLE?
Any UK or European games development company creating and/or producing games for mobile devices and/or handheld games platforms, such as iPhone/iPad, Android, PSP or DS. Studios should have had some significant output in the last 12 months.

LAST YEAR'S WINNER
2010: SCEE Cambridge

PREVIOUS WINNERS
2009: Rockstar Leeds
2008: Idealworks 3D
2007: Rockstar Leeds
2006: Gameloft
2005: Morpheme

MICRO STUDIO

WHO'S ELIGIBLE?
Any UK or European games developer – consisting of an individual or small collective of people up to a maximum of 10 – who have had significant original output in the past year.

LAST YEAR'S WINNER
2010: Hello Games

INDEPENDENT STUDIO

WHO'S ELIGIBLE?
Any UK or European games development company, staffed by 11 people or more, and which is not owned or managed by a publisher working on any available game platform. Lobbying studios should have had some significant output in the last year.

LAST YEAR'S WINNER
2010: Quantic Dream

PREVIOUS WINNERS
2009: Media Molecule
2008: Splash Damage
2007: Traveller's Tales
2006: Traveller's Tales
2005: Traveller's Tales
2004: Crytek

IN-HOUSE STUDIO

WHO'S ELIGIBLE?
Any UK or European publisher-owned games development company or in-house games development resource – including those acquired recently – working on any currently available games platform with title(s) released in the past year.

LAST YEAR'S WINNER
2010: Rocksteady Studios

PREVIOUS WINNERS
2009: Rockstar North
2008: Rockstar North
2007: Ubisoft France
2006: Criterion
2005: Rockstar North
2004: Ubisoft France

DIARY DATE: DEVELOP INDUSTRY EXCELLENCE AWARDS
Wednesday, July 20th, 2011. Hilton Brighton Metropole Hotel

// INDUSTRY RECOGNITION

DEVELOPMENT LEGEND

WHO'S ELIGIBLE?
The winner of this award, especially chosen by the *Develop* team, is an individual who has made a significant impact on games development – in a commercial, creative or technological sense – during their lifetime and career

LAST YEAR'S RECIPIENT
2010: The Gower Brothers (Jagex)

PREVIOUS WINNERS
2009: Phil Harrison
2007: Ian Hetherington
2006: Charles Cecil
2005: David Braben
2004: Peter Molyneux

GRAND PRIX

WHO'S ELIGIBLE?
This is a special award from *Develop*, bestowed upon a European individual or company in recognition of outstanding achievements in games over the past 12 months. The candidate is decided after soundings from the industry.

LAST YEAR'S WINNER
2010: Unity Technologies

PREVIOUS WINNERS
2009: Codemasters
2008: Rockstar Games
2007: Sony Computer Entertainment
2006: Bizarre Creations
2005: Creative Assembly

// HOW CAN I TAKE PART?

When do the awards take place?
The Develop Industry Excellence Awards take place on Wednesday, July 20th, 2011 at the Hilton Brighton Metropole Hotel.

Can I sponsor the event?
There are a number of excellent promotional possibilities at the event. Those available include opportunities for category and award sponsorship, plus supporting editorial coverage to raise your profile before, after and throughout the event.

If you are interested you can contact **Alex.Boucher@intentmedia.co.uk** for more information on how you can get involved.

How can my company enter?
This one's simple. All you need to do is send a short pitch, either as a Word document or plain text email, to *Develop's* editor-in-chief at **Michael.French@intentmedia.co.uk**

Give us a bit of history and highlight your company's key achievements in the last year – and don't forget tell us what awards you want to be considered for.

You don't need to go into masses of detail, as we only need an overview and a run through of what your key achievements/recent releases are. Be brief; its easier for you, and for us. Remember, we know the industry very well and will have almost definitely heard of you.

You're also actively invited to lobby for other companies across the games industry – be it publishing partners, your favourite services or outsourcing outfits, and the studios that you both respect and admire.

Lobbying isn't voting, so there is no need to get all of your partners to put your name forward without any detail.

What's the eligibility period?
For those awards criteria based on newly released products, please note that to be eligible the games in question must have been released somewhere in the world after June 2010 and by the end of April 2011. That counts whether the game is a physical or digital release.

So what's the judging process?
When all nominations are in, they are appraised by the *Develop* editorial team. The team then decides upon a shortlist for each award based on the lobbying documents and industry standing.

Profiles of the shortlisted companies are then sent out to a judging panel made up of 100 industry executives hand picked by the *Develop* team.

The judges confidentially disclose their choices and those with the most votes win. Simple.

The names of the judges are only named after the event.

I want to come along! How can I attend the awards?
Given the increased pressures on developers' wallets and studio budgets in recent years we've actually dropped the prices – how many award events can say that?

Early bird prices, for those tickets or tables booked on or before June 7th, are: Gold Table of 10 – £1,975 + VAT; Standard Table of 10 – £1,750 + VAT; and Single Seats – £195 + VAT.

After June 7th the prices change to:
Gold Table of 10 – £2475 + VAT;
Standard Table of 10 – £2290 + VAT;
and Single Seats are £235 + VAT.

To book your place at the event contact **Kathryn.Humphrey@intentmedia.co.uk**

nordicgame

MALMÖ, 10-12 MAY 2011

The Nordic Game 2011 conference, 10-12 May 2011 in Malmö, Sweden, will continue its focus on bridging gaps within the industry, and this year's edition will use creativity and entrepreneurship as the point of departure. With the belief that insights drive innovation, the main mission of the Nordic Game 2011 conference is to give attendees the opportunity to think outside the box, by listening and talking to people who do exactly that.

JORDAN MECHNER
Creator of PRINCE OF PERSIA

ED FRIES
Co-founder of the XBOX PROJECT

BRANDON BOYER
Chairman, Independent Games Festival

Mike Acton
Insomniac

Eddie Dowse
PopCap

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UNDER **OXFORD** SPIRES

Famous around the world as a *seat of learning and culture*, Oxfordshire is also home to a strong development community. **Stuart Richardson** found out what life was like making games in an educational hub…

Exient's co-founder Charles Chapman (top) and Hugh Edwards, boss of High Score Productions

This area is home to some very bright people and we obviously benefit from that through our recruitment. We recently held a drinks event for upcoming graduates which attracted a great number of excellent candidates."

Torsten Reil, CEO of Oxford-based animation middleware firm Natural Motion, sings the praises of the games industry in the city and county in which his company operates. The advantageous links to high-level local education are obviously high on the list, but by no means the only thing he draws on.

"I think there's definitely a sense of community," he says.

"Quite a few of us meet up regularly for drinks or dinner and exchange data on the market, which turns out to be pretty useful given how fast the industry is moving at the moment. A lot of this has been developing over the last couple of years actually; before that, we'd often bump into each other at GDC instead of the local pub."

Jason Kingsley, CEO of indie triple-A studio Rebellion, is also a keen advocate of the benefits of an Oxfordshire location.

"Chris [Kingsley, Jason's brother and Rebellion CTO] and I set Rebellion up in Oxford because we were both students at Oxford University and it seemed like a great place to start a company. It's less expensive than London and comes with easy access to the university for recruiting staff," he says.

"Being close to London and Heathrow is useful for our international clients. The communications infrastructure is quite good, although studio space is at a premium in Oxford because the university occupies so much of it.

Maintaining a strong relationship with local education is also something that is integral to the studio's processes.

"Chris and I have a good relationship with Oxford University, having been there as students, and we liaise with them wherever possible," Kingsley says.

> ***"I would hope that we are percieved as punching well above our weight given the ratio of developers here compared to the size of the area."***
>
> Mick Morris, Audiomotion

"Similarly, our active work placement scheme works with local schools and we take as many students as we can to give them a chance to sample life in a creative studio. Hopefully this is giving back to the community and possibly helping to educate the next generation of games developers."

THEIR DARK MATERIALS

Mick Morris, managing director of mocap company Audiomotion, expands on the nature in which the development industry in the city and picturesque surrounding countryside operates, reinforcing Reil's 'community' statement.

"All of the local developers are customers and have used our services at some point over the years," he explains.

"I regard the local studio heads as friends as we don't compete for business. I think there's an ability and a willingness to help each other out."

Morris also holds a strong point of view of the position that Oxfordshire development holds within the UK scene.

"The vast majority of our work comes from outside the area, from Europe, Russia and beyond," he says.

"I would hope that we are percieved as punching well above our weight given the ratio of developers here compared to the size of the area. People are very surprised to find that so much goes on. There are so many games and movies being worked on without anyone being aware unless the local press runs a story."

Charles Chapman, co-founder and technical director of local developer Exient, points out that the stregths of the Oxfordshire region can occaisionally be something that is nessesary to work against as well as with.

"The cost of living in Oxford is higher than the UK average – not far of London – and that creates its own challenges," he says.

"Another challenge is keeping some of the talent here, and in the industry as a whole, rather than moving down to London. Oxford graduates are courted throughout their time at university by the recruitment milk-round of big organisations.

"It's a challenge for us, and the industry as a whole to get careers in games at the forefront of people's mind."

There is an assurance that such difficulties will be overcome and that growth will occur for both the individual companies and the local industry as a whole, however.

"We would expect steady growth over the coming years. The industry has changed hugely in recent years, and will continue to change. So the future is probably more difficult to predict than before, but we believe we are well positioned to adapt and flourish," Chapman expands.

"Oxford and the surrounding areas have a great reputation for technical excellence, whether in software, science, or engineering. The games industry continues this, and combines software, science, engineering, plus creativity."

MUSIC OF THE SPHERES

Rich Aitken, production director at audio outsourcing firm Nimrod Productions, points out that the location of Oxfordshire geographically has a positive effect on the local games indstry and its numerous development, animation outsourcing and software companies.

"As an audio outsourcer it's very easy to tap into the vast array of top session musicians both in London and in Oxford," he says.

"The standard of orchestral players, for example, is very high in Oxford itself. There is a long tradition of great performance in Oxford so it's easy to connect with like minded souls in both music and voice acting.

"Further, being so close to the UK music industry in London makes communicating the licensing and sync parts of our projects very 'local'. It seems as if Oxford is almost local to everywhere."

Aitken also describes the various complexities of operating an active audio outsourcing company from within Oxford's internatonally famous and otherwise notably peaceful surroundings.

"In audio, the main issue is getting a physical location that allows us to work effectively with respect to noise levels coming from us and external sounds in the everyday world," he says.

"Buildings are very expensive here and you need to put your audio studios in a place that doesn't ruffle too many feathers with excess noise. It's a very 'heritage' location and you need to respect that. Luckily our locations and our partner locations are in just the right places."

> ***"Oxford and the surrounding areas have a great reputation for technical excellence, whether in software, science, or engineering."***
>
> Charles Chapman, Exient

Hugh Edwards, boss at High Score Productions, another major games industry audio outsourcer in the region, expands on the more general issues that face operations in the area.

"The one main problem with Oxfordshire is lack of investment in the infrastructure, but that's a country-wide problem," he says.

"The broadband speeds for example are relatively low compared to the cities. Luckily this doesn't affect us too much, and there are very easy ways around it. The roads are covered in winter potholes at the moment too, although that just adds something to the rural charm."

Reinforcing Aitken's points about working in a prime location, however, Edwards is a strong advocate of the region's strengths within the UK scene.

"There are a couple of other audio outsourcers in the area, and I think they are in this location for many of the same reasons we are," he says.

"Our model for voice production for example, is based on recording the voice-talent in the major cities like London, Milan, Berlin and LA, and then bringing the recorded content to Oxfordshire for the post-production.

"Because our rates are ridiculously cheaper than in London, we can pass this saving directly onto the customer. It's about location. The days of expensive studios in London are just gone. That model doesn't work anymore, unless you're stupid enough to actually want to pay double the price for no reason."

As for the future, opinion is extremely positive within the Oxfordshire development community – even in the face of international uncertainty.

"Predicting the future of the industry at the moment really is an impossible task," insists Exient's Chapman.

"But people in Oxfordshire are definitely in a greater position to prosper."

Nimrod's Aitken agrees on the point.

"Oxfordshire will remain an area of excellence," he says.

"It's a county that has an enourmous amount of creative, culturally relevant and productive talent. Long may that continue."

All the indicators suggest it will.

Rebellion CEO Jason Kingsley (top) and Mick Morris, MD at Audiomotion

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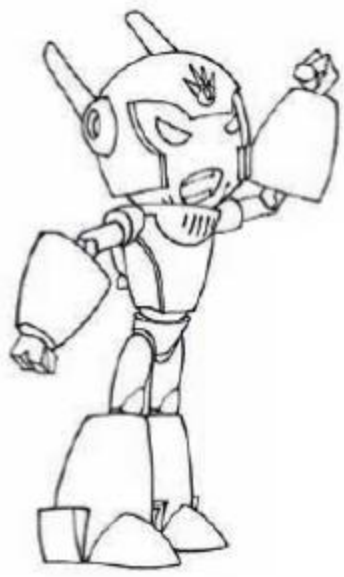
Learning Curve



An independent developer is proving that all the doom and gloom about studios closures isn't the entire picture. As **Will Freeman** finds out, for Curve, the only way is up…

The global game development community's anxiety in recent months is well known. The closing gap between budgets and sales totals has made many understandably nervous, and studio closure stories have fuelled the doomsayers' appetite for negativity.

And then there is London's Curve Studios; an independent that has met with success by moving from work for hire to a focus on original IP and digital self-publishing. With *Explodemon!* and *Fluidity* Curve is proving that 'real' game development is still a viable business model, and offers good reason to be optimistic. *Develop* caught up with some of Curve's 32 staff to find out how they do it, and what they have planned for the future.

Curve's recent focus on original IP and self-publishing is a bold move. What motivated you to head in this direction?
Jason Perkins, managing director: The typical answer, or perhaps the one you'd expect, is that we're creative people and sometimes we want to work on things that publishers might not feel are worth publishing.

That's *Explodemon!*, in a nutshell; a lot of publishers really liked it, and it got close to being signed a few times, but at that time there was uncertainty about publishers funding digital-download titles, so it fell through. But by this point the whole game was prototyped, and we'd seen people play it and really enjoy it – so we decided to just go ahead and do it ourselves.

Curve will always work with publishers, because despite the shit that gets said about them, they do have great input and can really help you shape the experience in the right direction – when you've got a good one, anyway. They give you the opportunity to go outside your comfort zone and – again, perhaps only in good relationships – their money helps you do amazing things.

But at the same time, we decided that it's really important that our company's existence isn't entirely based on the whims of these external entities. Publishing has definitely taken a downturn since the recession, decisions take much longer to get made, and opportunities to do 'mid-tier' games are dying out – either it's a 4m+ sales hit, or it's bust. So it's really important to us that we have some control over our destiny; a revenue stream outside of milestone payments. Far too many brilliant independent developers have died because of outside agents.

With regards to original IP specifically, Curve has always been interested in developing its own IP from the very beginning - this isn't really a new thing for us.

Previously we have applied original concepts and gameplay ideas to licensed products for Disney, Marvel and Nickelodeon. The difficulty as a fledgling developer is to gain confidence from a publisher that you can indeed create original IP, and typically that means you first have to prove yourself on conversions and work-for-hire projects. Luckily we've managed to prove ourselves, so it's a little bit easier to make that pitch.

What other challenges have defined Curve's experience of own-IP titles?
Ed Fear, publishing producer: On the publishing side of things, the main lesson was that it's much easier said than done. Everyone says 'self-publishing is hard' and you nod and say 'uh-huh,' and then you do it, and you think: 'Why was this much harder than I was anticipating?'

Getting through submission as a developer is hard enough, but when you're simultaneously trying to work out all of the administrative things involved in actually getting a game onto a digital storefront and putting it through four different age ratings boards, it can be a whole new level of hurt.

The first time is always the most painful, though, and it's a great learning curve, so we're glad to have gone through it.

There's a huge amount of stuff you have to figure out, and sometimes it is really not easy just to get your head around something. We've actually been helping out and advising other London indie developers who are working on PlayStation Network titles, because there's a lot of mistakes we've made and lessons we've learnt, and it seems stupid for other people to have to struggle through those as well.

> ***"Despite the shit that gets said about publishers, they do have great input and can really help you shape the experience in the right direction."***
>
> Jason Perkins, Curve

We got advice from the likes of Doublesix and Hello Games that really helped us in making this journey, and it's really important that we pass it forward and share the knowledge. So if any PSN developers are reading this, get in touch.

What has Explodemon! taught you as a studio? How can you use the experience to better your future games?
Fear: I think we've learnt a huge amount over these last 18 months. If you ever want to appreciate what a publisher does, develop and market a title with your own money, and the list of things you miss will start to grow rapidly.

From Top: Jason Perkins, Jonathan Biddle, Richie Turner and Ed Fear

Above: Curve's PSN game Explodemon! breathes new life into the scoring-based platforming genre

Perkins: One of the most interesting things we discovered was how hard it is to discipline yourselves when you've not got somebody standing over to make sure things get done on time.

Perhaps our biggest mistake with *Explodemon!*, if we had to pick one, was in overreaching – we tried to do too much and ended up not having the time to polish some things as much as we'd like to have. We're still really proud of what we achieved, though.

When we sit down to plan out our next project, I think it's fair to say that we'll be much, much more mindful of scope and its effect on dev costs than we did before. With a publisher, you can present them with a wild idea and, if they're behind it enough, they'll give you the money to make it.

Now we have to do a sanity test to see if we can actually produce it on a small budget. Once it goes over a certain scale/cost, it has to go on the 'pitch to publishers' pile.

How does Curve approach tech?

Richie Turner, technical director: Our approach is to not reinvent the wheel, so we're very open to middleware. All of our games use Scaleform for the UI, and we used Fmod for the sound engine on *Explodemon!* too. For physics we tend to use open-source engines.

We've developed an in-house cross-platform engine that powers all of our games, but we're definitely not averse to using external engines where it makes sense. We do have a small team using Unity, which has quite a few fans within the office. Obviously, with the generally smaller scope – and consequently smaller budgets – of our games, we don't use things when we don't really need to use them, but in situations where it fits we're not hesitant to leverage other solutions.

> ***"We've developed an in-house cross-platform engine that powers all of our games, but we're definitely not averse to using external engines."***
>
> Richie Turner, Curve

Previously Curve has managed to form relationships with some very high profile development partners. How have you done that, and will it continue to be part of your studio roadmap?

Perkins: Absolutely. We're massively proud to have worked with the people we have, and we definitely want to carry that on.

The hard work to form these relationships started many years ago by arranging regular meetings with people we wanted to work with at all of the trade shows – GDC, E3 and so on. During these meetings we would update publishers on our recent developments and pitch new ideas which we thought would fit into their portfolios.

I think we had been meeting with Nintendo for some eight years before they showed any interest in one of our concepts which, eventually, became the critical-smash *Fluidity*.

Obviously, we have only been able to maintain these relationships and continue to work with our partners on new projects by ensuring that we deliver quality projects.

Jonathan Biddle, design director: When you work with a good partner, you definitely feel that the product you end up with wouldn't have been as good as if you'd done it on your own or with someone else. With *Fluidity*, for example, we were really able to

Above: Concept art from Explodemon!'s production

draw on the experience that Nintendo has in making games that appeal to a wide range of people, and that was invaluable in making it as good as it was. According to Metacritic, it was Nintendo's highest-rated original game of the 2010, which is something we're massively proud of.

Curve promotes a fair work-life balance, and purports never to do crunch. How do you make this a reality with the pressure of meeting deadlines and reaching quality benchmarks?

Biddle: Well, taking crunch to mean 'pre-scheduled stints of considerable overtime', yes, we never crunch. We do occasionally work outside our usual 10am to 6:30pm hours, but it's always compensated. And it's compensated transparently – none of this 'it'll be worth it' or 'you'll get a bonus' that many studios do. To put things into perspective, on *Explodemon!* I think the most anyone did was an extra three days over the course of the whole project.

It's definitely fair to say that it does put extra pressure on meeting deadlines, but we know upfront that we have a fixed number of working hours, so we just try our best to schedule realistically.

In terms of reaching quality benchmarks, though, I think it positively affects that. Our staff aren't worn out, they get to spend a normal amount of time with their families, and they don't feel like they're being exploited at all.

We really believe – and so do many cleverer 'sciency' people – that these factors will mean our staff are happier, and that means they'll do better work. So I think it's because of our working policies that we manage to hit those benchmarks.

How do you manage to find the right talent in the competitive recruiting space that is your London home? It must be quite a challenge.

Perkins: One of the advantages we have is a very agile workforce. In addition to an elite force of core, full-time staff, we also have an excellent roster of freelance people and trusted outsourcers that we can call upon as the workload demands.

Biddle: As for what draws people to Curve, the quality of life is a really big part of that. A lot of the people here are veterans from big studios from all over the world, and they come here because although we're not working on a huge triple-A behemoth that will be plastered all over bus stops, they can work on something that's both innovative and gameplay-focused, all while living a normal life.

> ***"I don't think the console market is going to die anytime soon, and there's a growing space for indies on those platforms – it's not just triple-A at all."***
>
> Jason Perkins, Curve

What would be the point of living in London if you never got to experience it because you were always working?

Similarly, working here is the antithesis of the 'cog-in-the-machine' syndrome – we're very flat hierarchically speaking, and everybody gets input into the final product. Our teams rarely get to more than 20 people, so nobody gets lost and ends up modelling rocks for three years.

Oh, and we work directly above a pub, and we have discount cards. Need we say more?

Can you tell us anything about your future development projects, such as *War Heads* and *Thick as Thieves*?

Perkins: We're currently working on three publisher-funded projects of varying sizes, about which sadly we can't say anything. We're also continuing to support *Explodemon!* – we have plans for DLC, a patch for the PlayStation 3 version, and ports to other platforms.

Aside from that, we're also out there pitching some original IP, and we're continuing to cultivate a portfolio of designs for self-publishing.

Thick as Thieves in particular has seen significant interest from two publishers, so watch this space.

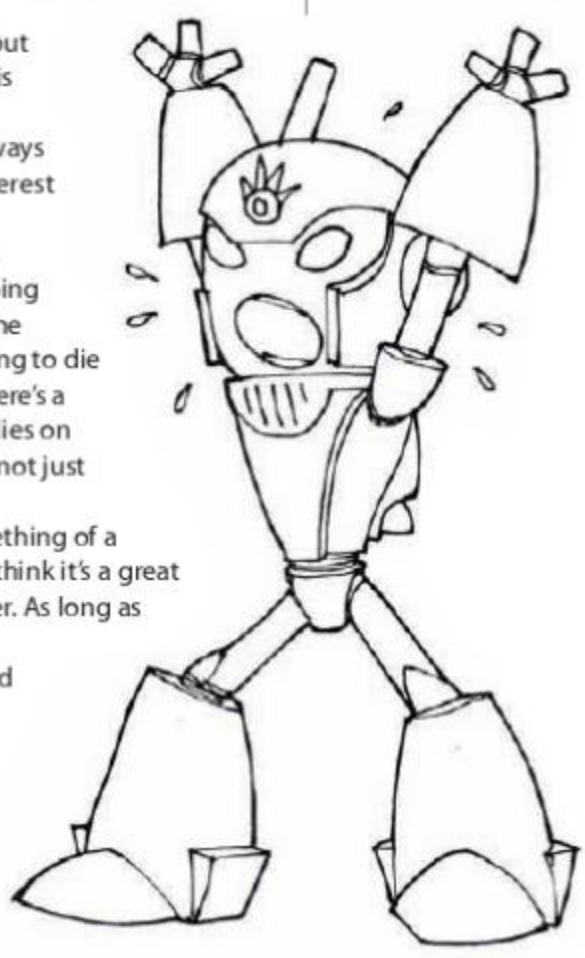
There's been a lot of focus recently on how difficult the development sector is today. As a successful indie that appears to be thriving, how do you feel about the state of the industry?

Perkins: I think there's a lot of scaremongering going on at the moment. A lot of influential people are saying that the home console market is dying, and that the new wave of handhelds won't be able to compete with the pricing of iOS and other smartphone games, but when you see who it is that is saying those soundbites there's always an element of self-interest involved.

There's definitely a transitional period going on, but I don't think the console market is going to die anytime soon, and there's a growing space for indies on those platforms – it's not just triple-A at all.

It's becoming something of a cliché, but I do really think it's a great time to be a developer. As long as you spread your development bets and balance self-funded projects against incoming revenues, there's plenty of life left in this business yet.

www.curve-studios.com



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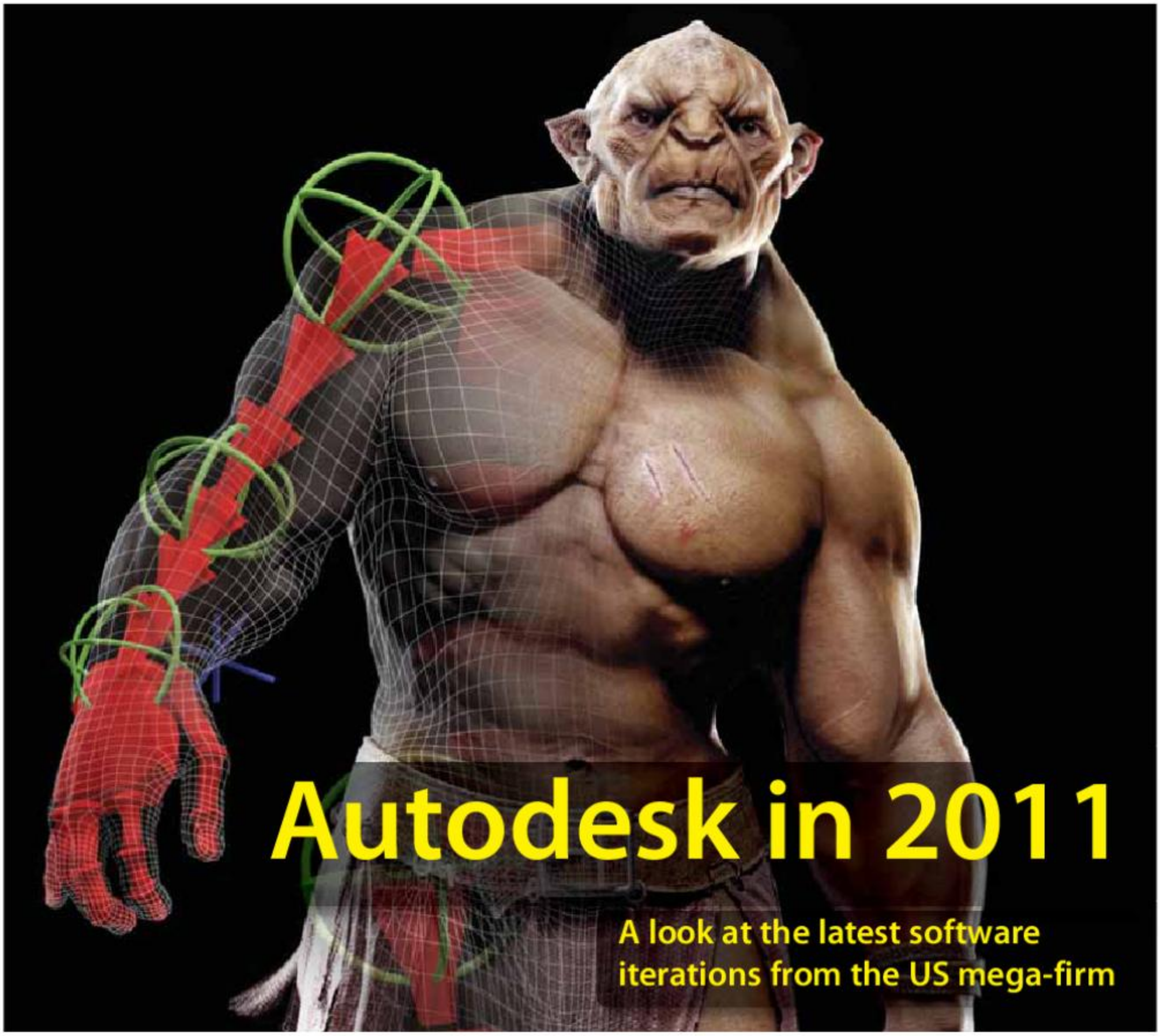


Autodesk in 2011

A look at the latest software iterations from the US mega-firm

EPIC DIARIES: THE NEW UDK LICENSING MODEL REVEALED, p59

INSIDE AUTODESK

This year may mark Autodesk's most significant move on game development yet. **Will Freeman** visits the company to find out about its tool updates, recent Scaleform acquisition, and a bold new concept project...

Autodesk's Marc Petit, and (far right) Mathieu Mazerolle and Eric Plante

At Autodesk's chic Montreal office 2011 is already proving a very busy year for the technology giant's games team.

As well as gearing up for the April launch of the 2012 versions of the tool suite that includes 3ds Max, Maya and the likes of Beast and Kynapse, there's the recent Scaleform acquisition. What's more, there's work to be done on the recently unveiled Project Skyline; a concept build of what Autodesk hopes will become a fully productised pipeline.

The idea behind Skyline is simple enough to grasp. It is effectively an evolution of the modern closed loop pipelines that themselves sought to better the familiar linear workflow that starts with asset creation and ends with runtime.

Born from Autodesk's expanding tool set and the increasing complexity of the tools that cater for the mid and late stages of a traditional pipeline, Skyline strives to make game development more efficient by adding live content authoring into the modern workflow. It also has the potential to save developers the huge cost of engineering their own closed loop pipeline.

IN THE LOOP

"The fact game developers have been building this kind of thing themselves shows how super important it is," says Eric Plante, Autodesk's games production manager. "The problem with how most people had built it, though, is that the artists were mostly left out of that loop at the beginning of the chain."

Recognising that problem, Skyline brings asset creation into the closed loop workflows studios have been creating internally but which tend to focus on assembly and runtime. Currently built for animation, Skyline's future may see it embrace other elements of the creative process. Its effect on the dynamic of a development team could be substantial.

"The impact is huge. Particularly in the case of the animator, it changes the workflow entirely," suggests Plante. "In the case of the programmer and the technical animator or character TD – those people assembling the animations – what we're proposing makes their lives a lot easier. Project Skyline changes the game."

"I look at it as an economy of creative decisions," adds Mathieu Mazerolle, games senior product manager at Autodesk, who sees Skyline as a shift in the balance of power of the workflow from which everyone will benefit. "If you can take more shots faster, and make those shots more informed, your going to get something kickass faster than anyone."

> ***"The world of browsers and plug-ins is going to fade pretty quickly because mobile is global now. 3G will become the way to deliver the internet."***
>
> Marc Petit, Autodesk

GETTING MOBILE

Aside from exploring the way pipelines can be bettered, Autodesk is also looking to the increasingly prominent, technologically muscular world of mobile as a place where it can make an impact.

"The numbers in the mobile space are staggering," says the company's senior vice president Marc Petit. "It's a real opportunity. What we're really looking at for Autodesk is that the mobile world has displaced fixed internet. The world of browsers and browser plug-ins is going to fade pretty quickly because mobile is global now. 3G will become the way to deliver the internet to the entire planet. That's going to change the entire ecosystem."

It's a world that's very different from the space that is Autodesk's traditional remit, but as mobile devices become increasingly powerful, the structures and teams for developing games are starting to mirror those that create triple-A console and PC titles.

"Everything is up for grabs and the platform is very different, so we see this as a huge land of opportunity," concludes Petit.

The Scaleform acquisition is also part of Autodesk's broadening of horizons, and delivers a significant boon to the company's already diverse middleware offering.

"The architecture of Scaleform is very robust and very well thought out," declares Plante. "I'm very impressed with the tech that they have. It's not easy to build systems for 2.5D menus and have them be high-performance because nobody wants to pay a heavy price for menus. They've really figured out how to keep a low footprint in terms of CPU and being able to produce mind-blowing menus."

With Scaleform welcomed into the fold, and an eye set keenly on mobile and pipelines, it seems Autodesk's appetite for expansion is insatiable.

Thankfully for those working on the floor of studios the planet over, the technology company's benchmark for quality remains set suitably high, and all look to set gain from Autodesk's barnstorming progress in the game development space.

THE GAMES PLAN

As Autodesk's vice president of the Games Technology Group, Marc Stevens knows Project Skyline more than most. **Will Freeman** wonders just what it means for games developers...

It seems that Autodesk is more closely aligning and integrating its various game development technologies. Is Project Skyline part of that process?
Project Skyline lets you see where we're trying to go with integrating not just the content authoring, but the runtime authoring and the runtime so it's in one place. While Skyline is currently an animation focused project, a platform inside of Maya like that is something that's going to be extended to lighting and UI, and to all these other pieces of game content authoring to bring everything into the same simplified workflow.

How does the acquisition of Scaleform fit in with Autodesk's roadmap?
In the last few years we've started to get more into supplying runtime technology with Beast and Kynapse, and our own HumanIK product. Scaleform is a company that has been one of the most successful middleware companies supplying technology to the games market, and they have a ton of experience doing that.

We're at the point where we're looking at all this activity on web and mobile platforms, and Scaleform is out there supporting that space. We see this as a way for us to start working with these mobile developers today.

So Autodesk is making a specific move on the 2D and mobile space?
Like it or not most of the content for those mobile platforms is still 2D. We do great 3D tools, and we believe more and more mobile content will use 3D over time, but waiting until when they do isn't the only thing to do.

What we can do now is, little by little, bring some of the Scaleform and 3D tools together, and allow people to supplement their 2D games with some 3D. We can have people start to augment their 2D content with some interesting 3D content in an incremental way, which isn't intimidating. Scaleform fills an important part in the whole Skyline initiative to bring 2D and 3D together, and merge those worlds.

Is that where the motivation to create Project Skyline came from?
If you look at the kind of content that's being developed, especially for all these web and mobile platforms, you can't afford anymore to have a huge team of engineers and customised pipelines for every piece of output that you do. It's not feasible or cost effective. People are looking for more integrated tools so they can make interesting games and still be competitive. That's where this technology can play a role.

> ***"People are looking for more integrated tools so they can make interesting games and be competitive. That's where Skyline can play a role."***
>
> Marc Stevens, Autodesk

Many developers work with well-established proprietary pipelines. That considered, what role does Skyline serve?
Skyline is two things for us. It sits in the middle where we're trying to simplify, but it is also going to be a solution where you can take bits and pieces and just decide to use those as you need to.

All the established proprietary games pipelines have workflows and technologies people aren't just going to throw away. We're being sensitive to that and being flexible. We're providing something that can be used in pieces that can also provide a simpler solution out of the box.

And will Skyline be something that will be useful for a wide range of studios?
People have done something like Skyline with their own tools, but what we're trying to do is productise it. People may have made something similar work for a specific game in their specific pipeline, but what we're trying to do is make a solution that all kinds of developers and platforms can leverage.

How will development teams change within studios that adopt Skyline?
Engineers, levels designers and artists won't go away. You have artists, who create the content; engineers, who write the runtime and optimise code, and then you have level designers in the middle doing the gameplay and runtime content authoring. What we're trying to do is create a canvas that lets all three of them work together.

Today the process goes through one tool, the data is exported, then there's another tool, and there's just no links back. That makes debugging and making changes hard. We want to simplify this so those same people will be doing similar things, doing it faster, finding and fixing things quicker, which will leave them more time to improve the content.

Above: Autodesk's vice president of the Games Technology Group Marc Stevens, is, with his team, helping change the way modern pipelines work

AUTODESK 2012 **PRODUCT FOCUS**

While the 2012 updates to Autodesk's tech suite are defined by refinement over revolution, they are still significant. **Will Freeman** looks at what's new, and how the tools will change the day-to-day life of their users...

3ds Max 2012

THE NEWEST version of Autodesk's widely used modelling, animation, rendering and compositing application has been restructured with an emphasis on improved in workflow, user interface and performance.

It's also bolstered by Nitrous – a rewritten multi-threaded accelerated graphics core that promises to improve overall productivity.

And, like all the 2012 tool updates from Autodesk, 3ds Max 2012 features single-step interoperability with the company's other products to smooth workflow for artists.

Delving deeper into 3ds Max 2012, a new library of 80 Substance smart textures and filters – tiny, multi-output, customisable and resolution-independent – have been added, as has a new feature in mRigids' Rigid-Body Dynamics; the first module released in the new MassFX unified system of simulation solvers. It lets artists use the multithreaded Nvidia PhysX engine to create dynamic rigid-body simulations directly in the 3ds Max viewport.

Meanwhile the newly integrated, Nvidia GPU accelerated iray rendering technology enables users to achieve more predictable, photorealistic results without having to concern themselves with rendering settings; something Autodesk is comparing to the simplicity of point and click cameras in contrast to the complexity of SLRs.

> ***"Sculpting and painting enhancements have been implemented, letting 3ds Max customers enjoy greater control."***

Also new to 3ds Max 2012 is the enhanced UVW unwrapping, which lets artists create better UVW maps with less investment of man hours, thanks to the Least Squares Conformal Mapping (LSCM) method, which preserves local angles of mesh faces in order to help minimise texture distortion.

Sculpting and painting enhancements have also been implemented, letting 3ds Max customers enjoy greater control over brushstrokes and their effects on geometry. Particularly interesting is a new conform brush, which has been conceived to be useful in topology reduction workflows. It guides geometry towards another surface, with the degree of the conforming effect varying from softly approaching to shrink-wrapping.

Other enhancements to FBX file link, ProOptimizer, UI and several other elements make 3ds Max's 2012 update one that should prove remarkably popular with its users.

usa.autodesk.com/3ds-max

Maya 2012

THE ENHANCEMENTS to Maya 2012 are no less substantial than those to 3ds Max. The rendering and compositing software introduces a number of toolsets for previsualisation and prototyping, as well as extended simulation capabilities and better pipeline integration.

Foremost of the upgrades are the improvements to Viewpoint 2.0, which now provides users with motion blur, depth-of-field, and ambient occlusion full-screen effects, meaning artists can evaluate their creations in a high fidelity environment without having to render or export to game engine.

The ability to create and edit node-based representations of render passes and render the composited output directly using the mental ray renderer has also been introduced. This provides a tool for verifying and refining render passes prior to handing them to the compositor. The node-based render passes also allow artists to perform some simple compositing tasks without the need to leave Maya.

Maya 2012 additionally supports the editing of animation directly in the viewport, without the need to switch context to the graph editor. The editable motion trails again simplify the workflow and potentially save vast amounts of time, in this case by letting animators intuitively edit the position and timing of keyframes in relation to an animated object, while viewing the path of motion over time in 3D space.

> ***"Artists can now evaluate their creations in a high fidelity environment without having to render or export."***

Additionally the Camera Sequencer introduced in Maya 2011 is now extended substantially so as to offer a Sequencer Playlist. This new feature grants artists the power to manage their sequences through a fully configurable spreadsheet view that provides the ability to reorder clips, edit in and out points, and change various camera assignments.

A library of 80 textures and filters has also been added, and four new camera rigs from the Craft Director Studio animation tool are included to allow for for the creation of believable, complex camera movements that mimic real-world setups.

New simulation options that incorporate the multithreaded Nvidia PhysX engine have also been established to enable Maya users to take advantage of static, dynamic and kinematic rigid-body simulations directly inside the Maya viewport.

usa.autodesk.com/maya

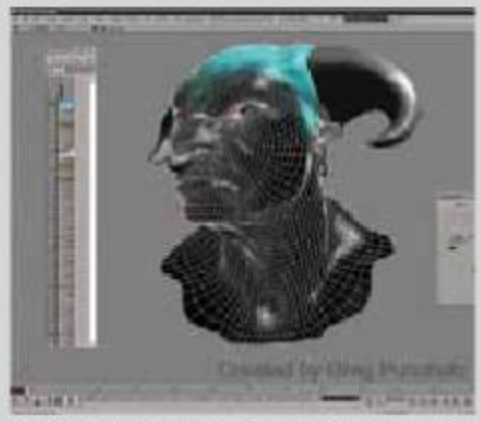
Softimage 2012

THE 2012 update to 3D character animation and visual effects software Softimage includes a large number of upgrades, the most significant of which are the new procedural ICE modelling, integrated Syflex cloth simulation, increased capabilities to support stereoscopic work, and like many of the other Autodesk tools, multiple improvements to the viewport display.

The new procedural ICE modelling enables non-destructive geometry creation, based on rules, conditions and parameters that facilitate topology operation creation, particle meshing, custom primitives and geometry fracturing, all while preserving UV attributes. Meanwhile the Syflex integration enables more flexible node-based workflow of ICE to create and edit highly realistic cloth effects.

An ICE FX Builder module menu toolbar has also been added, which automatically connects compounds and nodes for the simple modification and extension of effects using the standard editing workflow.

Elsewhere the updated Lagoa Multiphysics framework has been implemented to let Softimage artists build realistic simulations of the dynamic behaviour of liquids, cloth, foam, plastic and soft body collisions, as well as incompressible fluids, inelastic, elastic and plastic deformations.



Mudbox 2012

MUDBOX'S 2012 version introduces a number of new and enhanced features that are designed to make the process of painting both more efficient and flexible.

Of all the updates, the option of UV-less painting will perhaps save the most hours in a working day, as it grants texture artists the ability to eliminate or reduce the time-consuming endeavour of crafting UVs. The resulting textures can then be exported as Ptex files for an entirely UV-free process, or, for pipelines requiring UVs, baked into UV space.

Mudbox 2012 also features a new texture and tile management system that lets users paint and manage large texture datasets, and includes new paintable layer masks for paint layers that enable artists to selectively reveal or hide portions of layers.

An additional newly introduced ability to deform stencils to align texture data enables the use of available images to rub or project detail onto models to underlying model features.

A wealth of other performance improvements to Mudbox 2012 have been implemented to assist artists looking to paint and sculpt more smoothly at higher resolutions.

MotionBuilder 2012

WHILE MOTIONBUILDER is geared most explicitly towards film makers wanting to harness its virtual movie-making and animation functionality, it remains a popular tool with many game studios.

Many of the 2012 updates will be of particular interest to developers.

Take, for example, the unification with Autodesk's middleware solution IK, which sees more coherent workflows and improved interoperability between the products, which in turn means MotionBuilder will work more consistently with a given game engine. Furthermore, new live video-in means reference video from a motion capture session can now be streamed directly into MotionBuilder and recorded simultaneously in parallel with mocap data on a per-take basis.

Previously handled as a separate process, this new feature will let users better visualise the end results, meaning they can troubleshoot errors, reducing the need for later disruptive changes.

MotionBuilder has also undergone a user interface scheme overhaul, which consumes less screen real estate, and provides greater consistency with other products in the wider Autodesk suite of digital entertainment tools.

2012 Middleware

AS WELL as picking up GUI specialist Scaleform, Autodesk has also made efforts to improve its existing and sizable middleware offering.

Global illumination tool Beast, character animation solution HumanIK, and AI software Kynapse have all been updated for their 2012 versions.

Beast's improved API means games developers can integrate the eRnsT interactive lighting preview tool into custom game level editors, while its new UE3 integration makes it a great deal easier for those using Unreal Engine with the popular solution in their projects.

Moving on, in keeping with Autodesk's ambitions for portable devices, inverse kinematics system HumanIK has been optimised for mobile platforms, enabling its users to apply its functionality to their iOS and NGP titles.

Last but not least, Kynapse has undergone what is probably the most substantial update to any of Autodesk's range of middleware.

It now uses significantly less memory and provides far greater performance for those harnessing its real-time 3D path-finding, spatial awareness and team coordination abilities.

That means developers working with Kynapse can now execute greater and more accurate control over the trade-off between CPU and memory consumption versus the precision of the AI solution

The tool's PlayStation 3 support has also been bettered, so navigation mesh algorithms can now execute on a synergistic processing unit (SPU).

Additionally, further pathfinding optimisations have been put in place to make it easier for users to more quickly determine the existence of a path between two points.

KEY RELEASE

Will Freeman turns an eye to Image Metrics' facial animation solution...

WHAT IS IT?: A marker-less facial animation package that leverages video capture technology
COMPANY: Image Metrics
PRICE: See website
www.image-metrics.com

Faceware promises to deliver results fast, and has been used in numerous high profile games including Red Dead Redemption

IMAGE METRICS' marker-less facial capture tool Faceware has now been in development for over a decade, but that doesn't mean it's anywhere near an evolutionary dead end.

In fact, the new 3.0 update is the most significant to the animation solution yet, which takes Image Metrics' popular technology from service to software, giving far more creative control to its users.

The fundamental workings of Faceware 3.0 are simple. It utilises a marker-less video analysis technology and an artist driven performance transfer toolset that lets actors work without restriction, and developers capture using ordinary camera equipment.

Allowing the application of captured data to any rig, it promises to deliver high quality results quickly, and with minimum disruption to any studio embracing Faceware for the first time.

FACE VALUE

For the Image Metrics team, making Faceware 3.0 available as 'software as a service' was a no brainer.

"Offering Faceware as a product is so much more attractive to so many more people, because all creative decisions are made by the studio," says the company's technical account director Peter Busch. "We've been doing this so long, it's also got to the point where we know this is proven. It's absolutely battletested to the point that we know it works, which is why we're confident to put it on the web for free."

Developers working with Faceware need only part with cash at the processing stage, either per-job or through a subscription.

Processing sees captured performances uploaded as digital video files through Image Metrics own secure cloud-based portal. The performances are then delivered as an Image Metrics Performance Data (IMPD) file, which artists can import into Faceware to drive poses they set on their rigs, before defining the relationship of actor to character.

Image Metrics, which also still operates as a straight up facial animation service provider using Faceware technology, has also introduced a number of new features to the 3.0 update, the most substantial of which are its automatic pose suggestion functionality and its shared pose database.

STRIKE A POSE

The new 'auto pose' feature lets animators reduce production readiness by highlighting the most extreme video performance frames which need to be added as relationship poses. With the poses set in place, re-target results are delivered fast, while rapid iterations of the poses produce additional results in near real-time.

Meanwhile, the shared pose database lets lead animators establish a character prior to animation beginning, in a move designed to increase efficiency and consistency. Poses can be committed to a network pool which artists working on all subsequent performances of a given character will be able to access. At that point Faceware 3.0 is able to deliver an initial animated result onto the rig before any artistic iteration.

Other updates include a new character set-up feature within the re-targeting toolset, a pose-based retargeting interface that lets artists set the relationship between the actor's performance and the desired animated result on the character, and curve refinement that allows animators to take results output from the re-targeting algorithm and adjust them to suit the intended usage.

For those looking for a facial animation solution that negates the need for investing in the expense and time drain typically associated with marker-based motion capture, Faceware's unobtrusive offering may deliver just the solution they are after.
www.image-metrics.com

Go with the workflow

Faceware's marker-less facial animation offering promises to cause studios that embrace it minimum friction as they familiarise their teams with its nuances.

"The biggest change on the day-to-day workflow comes from the fact that this is a performance driven piece of software, meaning somebody will have to adopt capturing video," confirms Image Metrics technical account director Peter Busch (*pictured*). It's a process he is confident is relatively easy to pick up, demanding what is essentially a 'point and shoot' process using ordinary video equipment.

"A lot of developers have never worked with video, or directed talent, but that's the biggest change," Busch insists. "Having been providing this as a service for eight years, we know how to do that really well, so we can run through basic training in an hour and a half. We can do that and have them produce results by the end of the day. It's really simple to get the hang of, so integrating it into a workflow is easy."

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Wednesday 20 July
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audio day

Thursday 21 July
A day of sessions dedicated to game audio and music, with world-class speakers and practical programme.

21 July 2011
indie dev day

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Thursday 21 July
The new **Indie Dev Day** aimed specifically at independent developers offers tons of sessions, a chance to meet publishers and mix with other Indies.
Plus, **Indie Dev Showcase:** a dedicated area within the Develop Expo (20-21 July) featuring some of the exciting and new indie projects currently under development.

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UNREAL TECHNOLOGY

unity

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EPIC DIARIES

Mark Rein details the newly restructured UDK licensing model

Chicken Coup
Developer: Trendy Entertainment
Released: February 2011
www.chickencoupgame.com

Trendy Entertainment has released the full source materials for its app Chicken Coup (above)

PREVIOUSLY WE'VE demonstrated what is possible with Unreal Engine 3 on mobile devices with the award-winning *Infinity Blade*, which took the iTunes App Store by storm in December.

We've also released iOS support for the Unreal Development Kit (UDK), which brought the first UDK-powered App, *Chicken Coup*, to the store in January.

Developed by Florida-based Trendy Entertainment, *Chicken Coup* is much like a cross between renowned iOS titles *Angry Birds* and *Flight Control*. Trendy has even released the full source materials for the game so that UDK developers can use it as an example of how to build thier own puzzle game for iOS.

We recently modified the terms of the UDK licence by increasing the revenue threshold for royalty payments. Under the new licence agreement, developers don't pay any royalties until their total revenue exceeds $50,000 (US). Beyond that developers keep 75 per cent of each dollar they receive and Epic receives 25 per cent.

FINANCIAL GAINS

The first step to making a UDK game commercial is to pay a $99 (US) fee at www.udk.com when it is time to start realising financial benefit; typically, this is when a game is about to go on sale. Prior to that point, you can use UDK for free. This is a one-time licence fee for your entire company for an unlimited number of games and apps across multiple platforms.

Having such a large royalty threshold makes it possible for developers to use UDK to establish themselves financially, keep overhead low and leverage the latest game engine technology.

Let's look at some real-life examples to understand what this means to a developer looking to establish themselves using UDK. These examples assume you've paid the UDK commercial licensing fee of $99 and your digital store keeps 30 per cent of gross revenue, so the most you're ever seeing on a $1 sale is 70 cents.

We noticed some people on our forums were confused and thought our percentage was applied to the price paid by end users. It is not. We only take a percentage of the portion of the revenue that you receive. In retail terms, this would be known as the 'wholesale' amount as opposed to what is known as the 'retail' amount.

CASES IN POINT

Example 1: You release an app with a retail price of $7 and it sells 10,000 units. The total retail sales are $70,000 but your digital store pays you the wholesale amount of $49,000.

Therefore, you owe Epic no royalties as you have not crossed the $50,000 threshold for revenue yet, so your total cost for using this world-class game engine technology has been $99, and you're well on your way to establishing yourself as a professional video game developer.

Example 2: You sell 15,000 copies of your $4.99 app. The total sales in the store are $74,850. You receive $52,395 of this as your revenue. Subtract the $50,000 threshold and multiply the remaining $2,395 by 25 per cent and you owe Epic a sum just shy of $600 with your total cost of using UDK in this situation being under $700. You've kept 69 per cent of the total money paid by end users and Epic has only received one per cent.

Example 3: Now you're cooking. You sell 30,000 copies of your $4.99 app for total app sales of $149,700. In this situation, you'd be paying Epic $13,697.50 and keeping $91,092.50 of the $104,790 paid out by the app store. That means you'd be keeping approximately 61 per cent of the sales earned by your game and Epic would earn nine per cent.

THE NUMBERS GAME

Once you go beyond these numbers you're likely on your way to becoming an established developer and we can work with you to transition to a full Unreal Engine 3 source code licence with support so you can take your business to the next level.

We have surprisingly economical licensing plans to suit nearly any size of project and budget. In addition, a source code licence opens up the possibility of exploring a larger variety of platforms made possible by having Unreal Engine 3 source code including: PC, Mac, Xbox 360, XBLA, PlayStation 3, PSN, NGP, iOS and Android.

Simple math shows that it's realistic to build a business with our technology. Epic is committed to regularly releasing free, updated versions of UDK. These updates give the community access to the underlying technology used to build *Infinity Blade*, *Bulletstorm* and *Gears of War 3*.

If you haven't tried Unreal Engine 3 yet, please check out the latest UDK release. There's nothing to lose. If you're ready for the next step, contact us.

www.udk.com

To discuss anything raised in this column or general licensing opportunities for Epic Games' *Unreal* engine, contact: **mrein@epicgames.com**

FOR RECRUITMENT OPPORTUNITIES PLEASE VISIT:
www.epicgames.com/epic_jobs.html

Canadian-born **Mark Rein** is vice president and co-founder of Epic Games based in Cary, North Carolina. Epic's Unreal Engine 3 has won Game Developer magazine's Best Engine Front Line Award four times along with entry into the Hall of Fame. UE3 has won three consecutive Develop Industry Excellence Awards. Epic is the creator of mega-hit *Unreal* series of games and the blockbuster *Gears of War* franchise. Follow @MarkRein on Twitter.

UNITY FOCUS

Will Freeman looks at looks at how using Unity rebuilt a Flash hit

BERZERK BALL
Developer: Berzerk Studio
Platforms: Flash, iOS
What is it: A popular 2D Flash game going multiformat
www.berzerkstudio.com

Using Unity allowed Simon Lachance (above) and his team to quickly re-develop Flash game Berzerk Ball for iOS

WITH APPLE still reluctant to open the doors of their iOS platforms to those wanting to run native Flash on the company's ever-popular devices, re-developing a title using Unity has emerged as an elegant alternative.

Recognising that fact, Berzerk Studios turned to the engine when it decided its successful Flash game *Berzerk Ball* deserved a wider audience. With a single programmer and one artist, the team spent a just 90 days rebuilding the game.

"After looking under the hood of how Unity 3d worked, we discovered that UnityScript was very similar ActionScript 3," says Berzerk co-founder Simon Lachance. "A few prototypes then showed that we could literally copy-paste code. Knowing that we could reach new markets with a minimal efforts was a no-brainer for us."

But it wasn't just comparable coding that made Unity a perfect fit for the job in hand. Bolstered by the tools created by Unity's famously proactive user base, Berzerk Studio found themselves in a position where they could work quickly and efficiently, and were even able to create their own tools within the engine's editor when they needed to do a little more than cut and paste.

"Unity's editor is very strong," insists Lachance. "To speak technically, we've made tools within Unity that have helped us convert our .as files (AS3) to .js file (UnityScript)."

IN PROFILE

Unity's profiler also proved invaluable to the Berzerk Studio team members reconstructing their cheerily gory game, which has made the App Store Top 100 in over 100 countries.

"Mobile devices have far less memory and processing power than a computer, so we had to optimise our game more than it's necessary on computers," explains Lachance. "With the built-in profiler, we quickly discovered that there were problems with our engine. After optimising the engine on Unity, we've made the same changes on the Flash version to gain an extra speed."

Of course, remaking the Flash version of *Berzerk Ball* for iOS wasn't completely without problems, and the team had to overcome significant challenges.

> ***"Developing for consoles is something that we have wanted to do since our first day of Berzerk Studios."***
> Simon Lachance, Berzerk

"Even if the language is very similar, there are still little rules to respect to convert your code efficiently," reveals Lachance. "Other than that the biggest gap is in the visuals. Flash uses vector graphics while Unity 3D uses textures."

BOLD AMBITION

The challenges met, Berzerk Studio has bold plans for its future using Unity.

"In the short term, being able to deliver our games on both iPhone and Android is a huge gain, but extending our expertise to consoles represents a long term gain as well," reveals Lachance. "Developing for consoles is something that we have want to do since our first day of Berzerk Studios, so working with Unity 3d was the first step in that direction.

"Not only does it give us access to new platform, but it also opens the door to 3D, giving us new ideas in terms of gameplay.

Quick Work

FOUNDED IN December 2008, Berzerk Studio was brought into being by its founding trio, consisting of Etienne Jean, Marc-Antoine Jean and Simon Lachance.

That original team has been making Flash games ever since, and prides itself on achieving incredibly fast production times, seemingly without detriment to a given title's final quality.

"Our fastest production time yet, from the idea to the final build, was with *Gunbot*," reveals Lachance. "We did the game in nearly three weeks. We now have nice inventory of games that covers a wide variety of gameplay genres such as strategic, action, casual, horror and RPG."

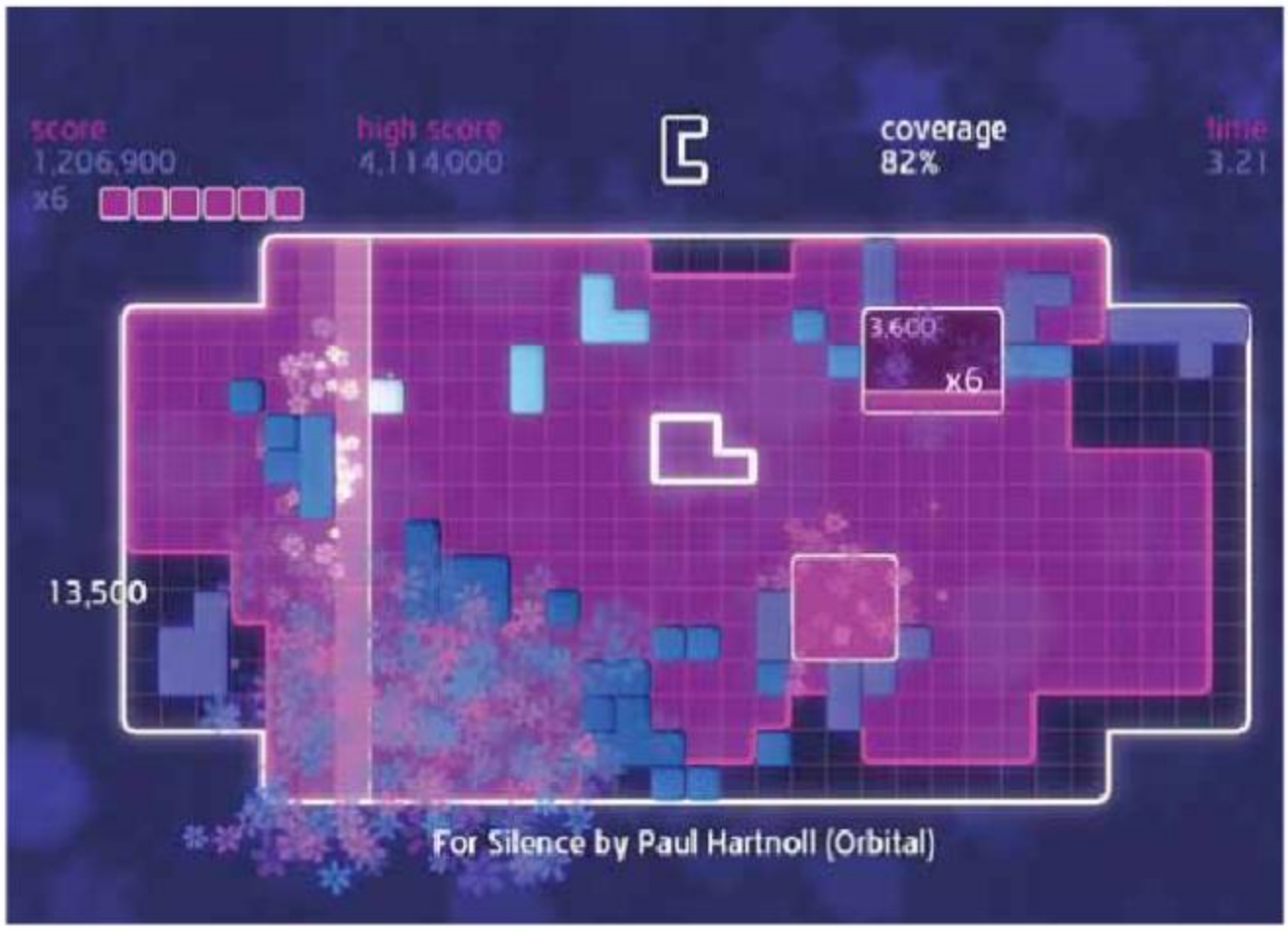
Berzerk's knack for rapid turnaround has taken much of the gamble out of releasing the small-scale games with which it has made a name for itself. In short, if you can complete a game in three weeks and it fails the time wasted is minimal. Happily for Berzerk, failure is an unfamiliar concept.

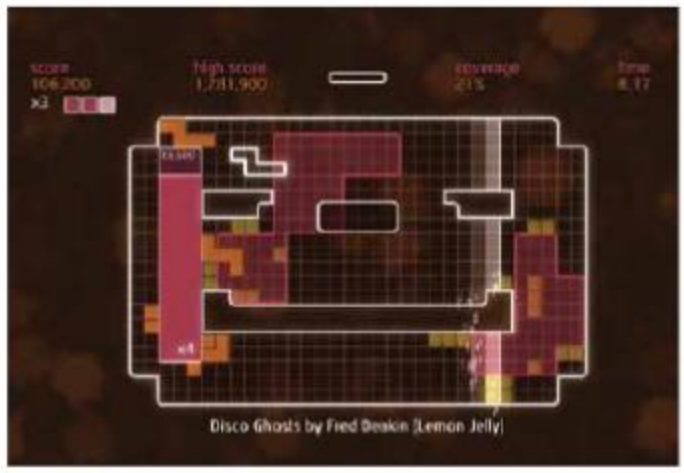
The developer remains dedicated to original IP and plans to stay that way. However, its indie spirit hasn't stopped it thinking big, and after it has completed rebuilding its Flash hit *Berzerk Ball* for Android, the studio has a number of other projects in mind.

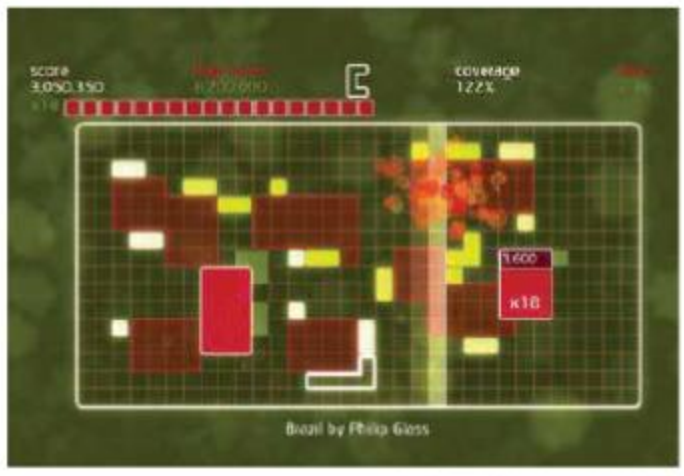
HEARD ABOUT

John Broomhall talks to Chime's audio director, Ciaran Walsh

CHIME/CHIME SUPER DELUXE
Developer/Publisher: Zoë Mode
Release Date: Out now (PS3 version due Spring 2011)
Platform: PC, PSN, XBLA
www.chimegame.com







CHARMING, CLEVER and cool – *Chime* simply could not integrate audio with gameplay any more closely in this interactive music-based puzzler.

Visually, the player sees a grid which is swept left to right by a radar-like beat line. The challenge? Throw some Tetris-style shapes by placing five-squared boxes of various permutations onto the grid, tessellate them together to create quads and speed on towards the overall objective of achieving coverage of the grid – visually and aurally rewarded on each fresh sweep of the beat line in time with the music. As the grid gradually covers, the points score and multipliers rack up.

Every single action and achievement is marked by music events, as Zoë Mode audio director Ciaran Walsh explains. "Firstly you have the music backing. Think of the grid as a musical sequencer; there's a pretty straight correlation between a beat line sweep of the grid and the musical backing loops running, and those available and ready to be cued in," he says. "The deployment of and progression through these loops is controlled by the players progression through the game – how much coverage they're achieving.

"Then there's the more direct music layer; the shapes the player places on the grid and the quads they create by grouping shapes together will all trigger musical sounds as the beat line passes through them. The shapes are essentially instruments – typically a shape will trigger a single note pitched according to height on the grid and in line with rules which define legal notes – for example ones which musically work with the harmony at that point. With quads, we reflect the permutations and proportions – so for instance, compared with say a tall and thin quad, for a long and wide one youll get a longer sound – maybe a percussion pattern or long delayed effect. If you make a really big quad, youll get a really big sound."

EDITORS NOTES

To achieve this super tight integration when working with licensed music from Moby to Philip Glass, artists must seriously trust the audio teams editing chops. They must allow them to take multitracks back to Zoë Mode towers, dissect the music to component level, and then re-create something credible and coherent in spite of some inherent run-time replay unpredictability.

For the new PSN release, artists who get it have supplied fully game-ready assets. One beatboxer even recorded in Zoë Mode's own studio and then worked with the team to create a brand new track.

> ***"Chime is the only game I'm aware of which deconstructs licensed songs and truly puts them together again in different ways."***
>
> Ciaran Walsh, Zoë Mode

Taking the title to a new platform prompted a change of technology, Walsh confirms: "The game has evolved over quite a long time. In the first XBLA version we actually used XACT for our audio, plus we built bespoke tech around it to control the music rules and behaviours.

"As we moved to PlayStation we decided to invest in a more future-proof cross-platform solution."

"Having had great experiences with it on other projects, Wwise was the obvious choice for us. Above all else, it improved our workflow – I generally find Wwise incredibly intuitive and quick to use once you've got your head around the concepts. Having added a lot of content for this refreshed iteration of the title, and having re-purposed a good deal of older content, we had to address mix consistency.

"That's where the real-time mixing functionality of Wwise really helped – being able to fire up a dev kit in the studio, sit there and literally pull all the parts around in real time was great – just to mix the game in as hands-on a way as you can get."

RINGS TRUE

"*Chime* is the only game I'm aware of which deconstructs licensed songs and truly puts them together again in different ways according to the players actions. It originated with a musical concept – that within a defined space any chaotic user input can be made to conform to musical rules of rhythm and harmony to generate coherent musical outputs and that the synaesthetic effect of tightly linking gameplay, visual and musical elements in an abstract space is more than the sum of its parts," confirms Walsh.

"The result is people feel completely sucked into the game – they get a kind of dream-like feeling from playing *Chime*. The feedback we get is that it has a really different atmosphere from most video game titles. It's almost meditative."

John Broomhall is an independent Audio Director, Consultant & Content Provider.
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www.johnbroomhall.co.uk

Top: Chime in action. Above: Zoë Mode's Ciaran Walsh, who has worked with numerous well renowned musicians on the project

SPECIAL IK

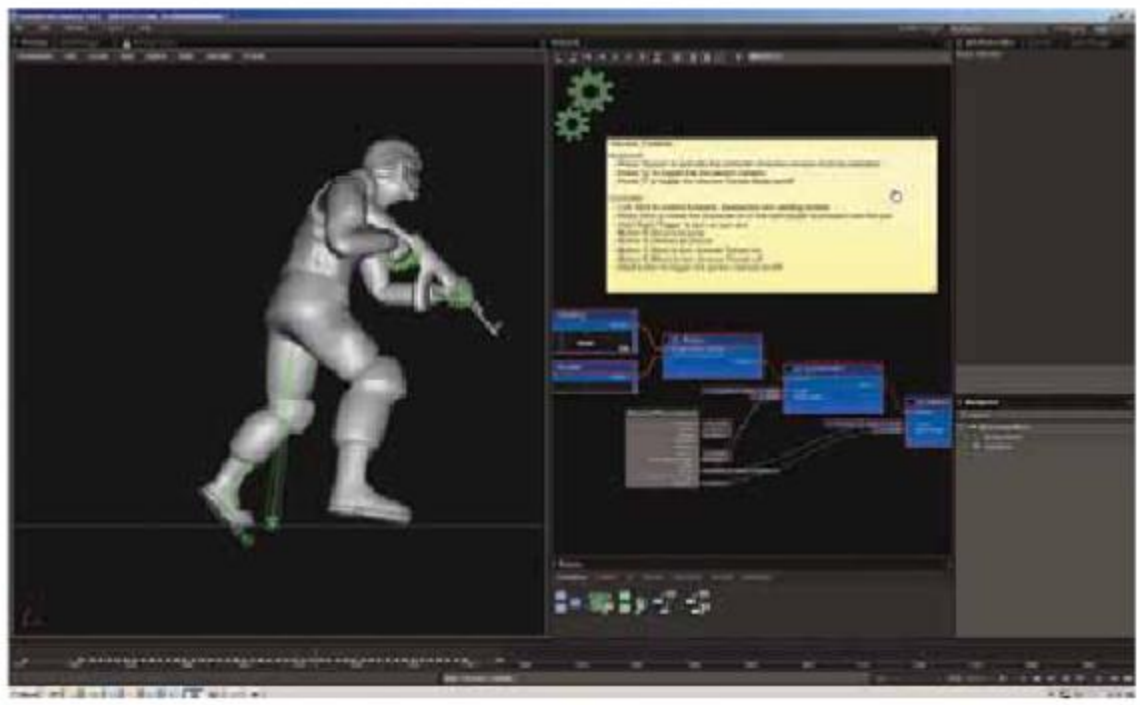
NaturalMotion's head of research **Joss Knight** knows a thing or two about implementing quality inverse kinematics. Here he shares his secrets on making your animations more convincing…

Maths is cool, but artists rule, says NaturalMotion's head of research and IK expert Joss Knight

So much of what makes in-game character animation jarring is from when it is allowed to stray too far from the animator's vision.

Morpheme's primary goal is to keep the output as faithful as possible to the original intentions of the artist – the authored animations. But with demand for variability and interactivity on the increase, procedural animation is an inevitable requirement to prevent the number of authored animations from snowballing.

Inverse kinematics, otherwise known as IK, is commonly used to help with interactivity. NaturalMotion's Research team have been pushing the envelope to come up with the handiest, snappiest, and of course sexiest IK toolkit for Morpheme.



WHAT IS IK?

IK is one the best examples of why maths is cool, and if you don't think so you're probably in the wrong business. The problem is simply stated, but notoriously knotty: the character is a kinematic system; we can tell by measuring the angle of each joint where its body parts, like the hands and feet, are going to be.

But if we want to get the hands and feet to a particular position, for instance to grasp an object or find a foothold on a wall – how do we tell what angles to set the joints to?

IK hails from the dawn of robot technology, and the control of robot arms. Its complexity lies in the fact that in general there are many solutions. Every time you scratch your back, or struggle to watch a football match through a crowd, you may find yourself exploring the search space of IK solutions.

Approaches to IK are numerous, but unless the problem is sufficiently specific, the solution is always iterative. This means you have to crawl your way, hill-climbing style, towards the solution, dodging the minefield of singularities and local maxima on the way.

Morpheme has competing goals to address. Modularity, so the same IK node can be used in different places in your network. Simplicity, so that you don't have to have degree level numerical programming skills to use it. And efficiency: like everything else in a Morpheme network, and indeed a game, we want the result so fast it leaves burn marks in the transistors.

> ***IK hails from the dawn of robots, and the control of robot arms. Its complexity lies in the fact that in general there are many solutions.***

For this reason we went with a toolkit of targeted, closed-form algorithms. Crucially, each is designed to make the minimum possible modifications to the input animation to achieve its objective, preserving the artistic intentions as well as the practical ones.

CONTROLLING ARMS AND LEGS

The most common use for IK in a game is to get the character's limbs to interact with objects; for example grasping or kicking a ball. Morpheme provides the TwoBoneIK node for controlling the standard humanoid arms and legs.

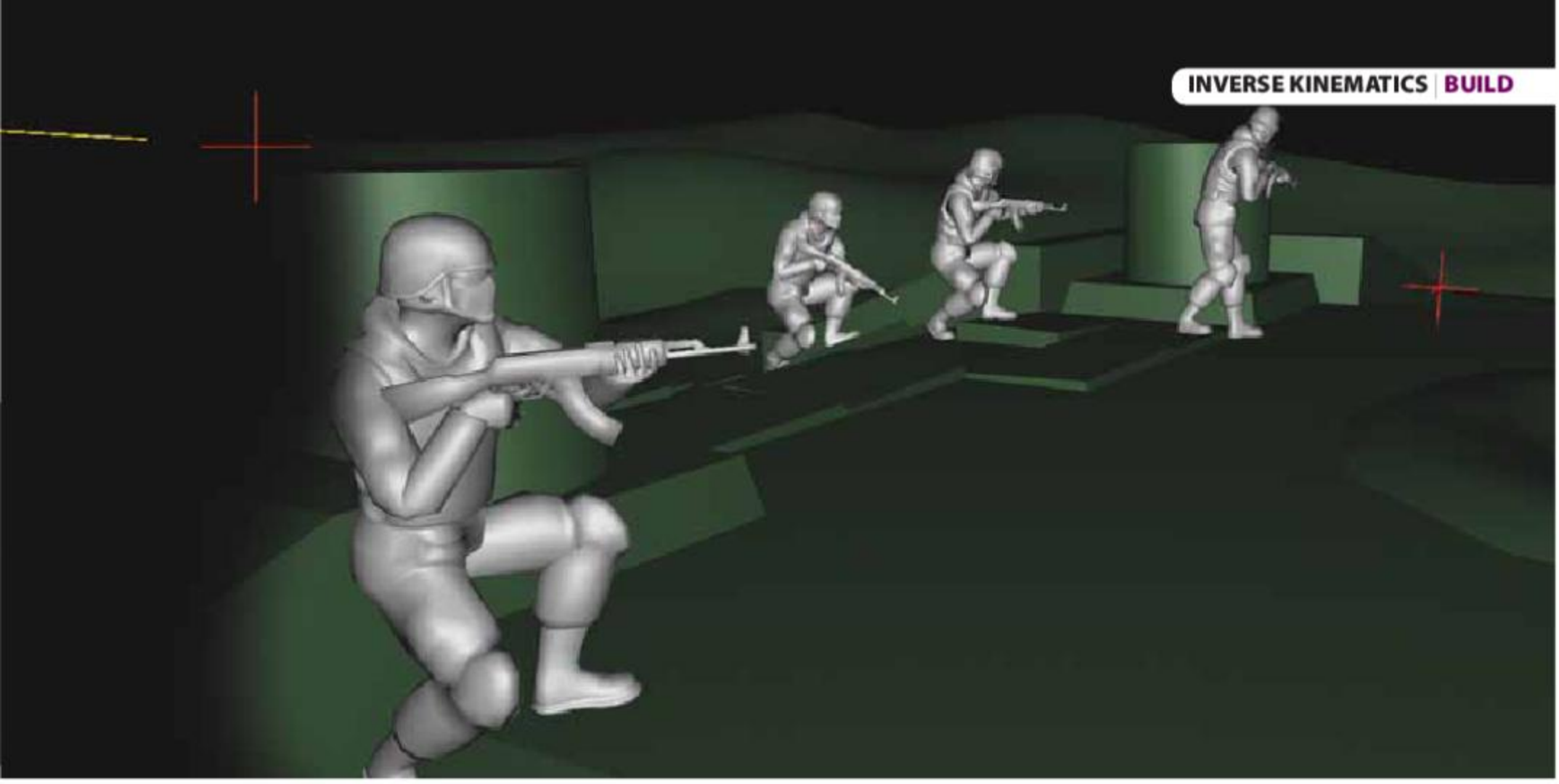
The algorithm is well-rehearsed: the middle joint is a hinge, so all you can do is bend it until the distance from the root (the shoulder or hip) to the end effector is correct. Then rotate the root to put the end effector in the right place.

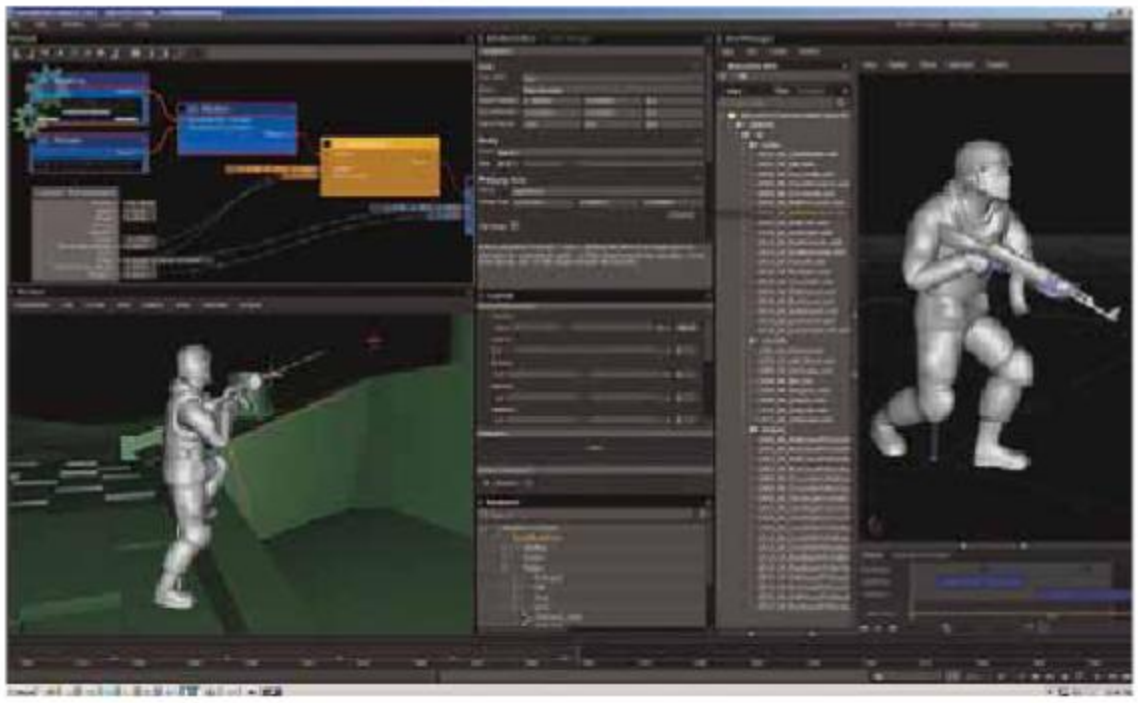
The practicalities are less straightforward. For a start, animators aren't always conscientious about rotating their elbows and knees around a particular axis. If the two bones don't move in a fixed plane, you can't use textbook Pythagorean maths to derive the rotation.

In fact, it turns out it is a quadratic you have to solve. That gives you two answers, or none, so you need to know what to do in all those cases.

PRO TIP FOR CLAVICLES

Want your arm IK to move the clavicle joint as well? Try stringing together a HeadLook node followed by a TwoBoneIK node. Use the HeadLook on the clavicle to point the shoulder towards the target, using a pointing vector approximately perpendicular to the torso. Use the blend weight input to reduce the rotation on the clavicle. Then use the TwoBoneIK node to control the rest of the arm as normal.





TwoBoneIK's answer is to choose the least change to the input, unless that means bending the limb backwards. And if there's no solution it has to find that out before it tries to take the square root of a negative number (unless you're a fan of NaN).

The same algorithm finds its way into several other nodes. The LockFoot node uses IK to eliminate footskate artifacts and correct ground-plane penetration, using a variety of geometrical techniques.

The Uneven Terrain nodes were a lengthy research topic in themselves. As well as using the two-bone algorithm to adjust footfalls for varying terrain, they adjust hip height, and use a variety of control methods to prevent sudden snapping when the terrain changes abruptly. Coming out in the next release, the Predictive Uneven Terrain node projects where the footsteps are going to go, so as to adjust the path of the foot in advance.

LOOKING AND POINTING

Realistic characters interact with the world at a distance, as well as more directly. Games can use Morpheme's HeadLook node to get the character to rotate the neck and spine to look at the scene or other characters in a dynamic way.

You can just aim the neck joint directly as if it is co-located with the eyes, which works okay for distant targets but is not very flexible. And what if you want to direct your gaze using only a joint in the spine?

When we looked into this we soon found that there weren't any textbook pointing algorithms that dealt with the general case, so once again we knuckled down and did the maths. That told us you can point at the target using any one joint or pivot.

Once you can aim one joint, then you just have to work out how to distribute rotation to all the joints involved.

The aiming algorithm isn't just for controlling gaze direction. It works just as well for pointing a hand, or a gun. However, we wanted a special node for aiming a gun which is braced against the body. By treating the brace point as if it were a normal joint, Morpheme's GunAimIK node gets the required aiming behaviour. Then it just fixes up the way the hands are grasping the gun – using our two-bone IK algorithm.

The GunAimIK node does the aiming, but it won't lift the gun into position for you – that's the job of the input animation, leaving the gun-holding style in the hands of the animator. If you want to aim from the hip, pump that into the node and your character will aim from the hip.

NaturalMotion has a lot more IK ideas in the pipeline. But whatever we introduce, you can be sure it will retain an artist-directed model. Maths is cool, but artists rule.

www.naturalmotion.com

Above: Conceptual images showing gaze direction, as well as the PredictiveUnevenTerrain, LockFoot, GunAimIK, and HeadLook nodes in effect.

Far left: LockFoot preventing the model clipping through the plane of the floor in the scene, and (near left) UnevenTerrain in the context of Morpheme

QUAT-SPEED PROCESSING

Morpheme processes animations using position vectors and rotation quaternions. This gives the most efficient packing, and is the only realistic approach for blending. Unit quaternions are pretty nifty for manipulating mathematically too. The usual way to formulate one is as a 3-vector (x, y, z) representing axis of rotation a, and a scalar w representing angle of rotation θ. In fact,

$$q = [x, y, z, w] = \left[\sin\left(\frac{\theta}{2}\right) a,\ \cos\left(\frac{\theta}{2}\right)\right].$$

(Programmers put the w term last in memory for easy conversion to a vector.)
Trig functions like sine and cosine are notoriously slow, but there's rarely any need to manipulate angles in radians, so you can keep everything in 'trig-space'. For instance, it's common to switch between the sine, cosine, and tangent forms using the classic substitution for tan-half-angle:

$$\sin\theta = \frac{2t}{1+t^2}; \qquad \cos\theta = \frac{1-t^2}{1+t^2}; \qquad \text{where } t = \tan\left(\frac{\theta}{2}\right).$$

If you get your answer out as tan-half-angle t, and you know the axis of rotation a, you can derive the quaternion for the rotation in a computational blink of a NAND gate. Just set q = [ta, 1], and then normalise. Easy as π.

THE HOT LIST

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Epic Games	+1 919 870 1516
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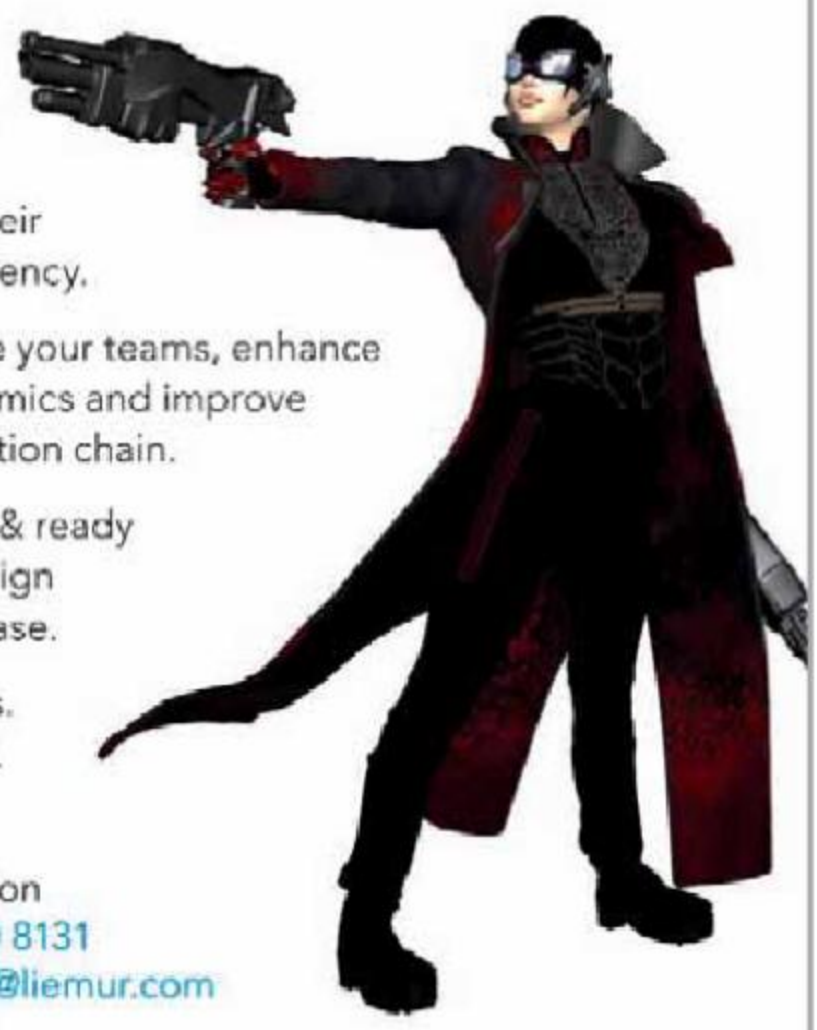

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PERSONNEL

This month: Pitbull Studio, Sumo Digital, Full Moon Game Studios and Valve

Pitbull Studio is moving to larger offices having hired more staff. The development outfit was born from the ashes of Midway's collapsed Newcastle operation.

"After private viewings of our current project, we've had many ideas and offers coming through almost daily for what we should work on next," said studio manager Robert Troughton. "There are definitely very exciting times ahead for the studio," he added.

As part of its expansion plans, the developer has hired former Eutechnyx man John Gibson, who takes on the role of lead character artist and animator. Also joining the team is Leigh Swift and Terence Burns.

Gibson is said to have been instrumental in the art direction of the *Wheelman* project – the final game released by Midway Newcastle. He will now lead Pitbull's character art team.

"We're very lucky with who we have here right now – as are our clients, many stating that we're well on our way to being the premier UK character asset creation source," said Troughton.

www.pitbullstudio.co.uk

Gareth Wilson, the former game design manager at closed Liverpool developer Bizarre, has found a new job at Sheffield studio **Sumo Digital**.

When at Bizarre, Wilson worked as a lead designer on both the *Project Gotham* series and *Blur*. It has been reported that he will act as chief games designer at Sumo – a studio with a pedigree in racing games.

Sumo, part of the Foundation 9 studio empire, has work on a wealth of racing games including *Outrun Online Arcade* and *F1 2009*.

Bizarre Creations closed its doors in February after Activision failed to secure a buyer for the long-standing studio.

The popular developer was put up for sale in November following disappointing sales of its acclaimed street racer *Blur*.

www.sumo-digital.com

At least twelve developers made redundant at Relentless have formed their own company.

Full Moon Game Studios was established on February 7th after Brighton-based Relentless shed as many as 20 staff to reorganise its business.

Kalvin Lyle, who was Relentless' art director before being made redundant, told *Develop* that a whole group of developers went on to join Full Moon.

"As soon as we formed there were between ten and 12 of ex-Relentless staff working here," he said.

Lyle, Full Moon's CEO, said there could be up to another ten staff joining the studio from other companies.

Full Moon's aim is to work as a game developer and outsource partner. The studio is already building its first iPhone game, one using the popular game engine Unity.

Develop understands that the group hopes to affiliate with another outsourcing company – in a partnership that would share workloads between both if either was overrun with projects.

Full Moon has also established a unique flexible hours structure, where developers can also work from home should they wish.

www.fullmoongamestudios.com

Washington-based studio **Valve** has hired Doug Church, the renowned game designer whose CV lists seminal projects such as *Ultima Underworld*, *System Shock* and *Thief*.

The appointment is an uncommonly high-profile one for Valve, which can already draw from its own squad of experienced lead game designers.

Church, a code-literate designer, has been working on game projects for over 20 years.

Having made major contributions at Looking Glass Studios, he left the group in 1999 to work as a consultant for numerous studios.

www.cubicmotion.com

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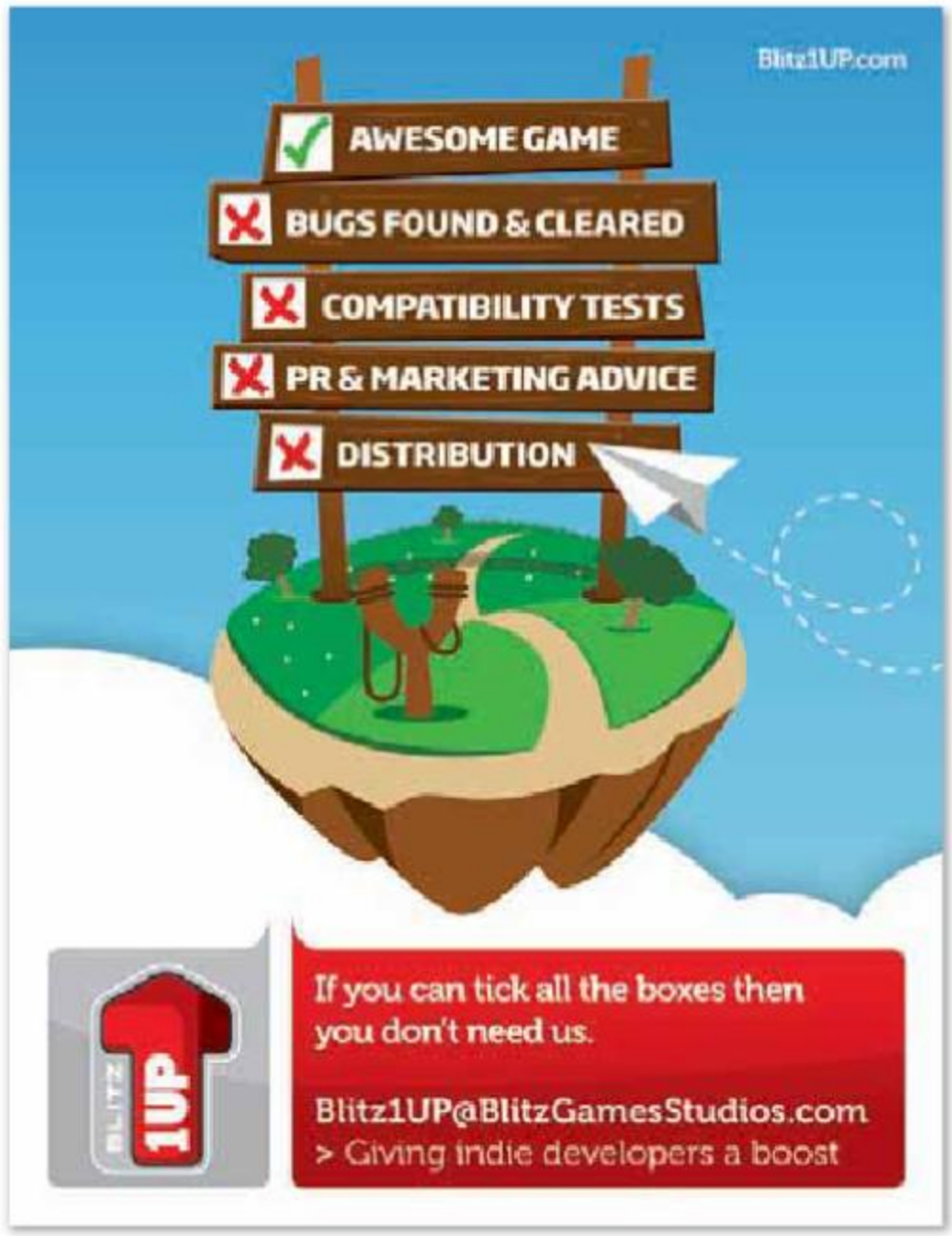

STUDIO SPOTLIGHT

This month: Jagex

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Studio co-founding brothers Andrew and Paul Gower began trading under the name of **Jagex** – originally short for 'Java Gaming Experts' – in 1999, with work on the MMORPG mega-hit *Runescape* beginning at the same time. The game was released in a free-to-play version in late 2001; the same year that Constant Tedder was hired as CEO and Cambridge-based Jagex came into being.

Within a year that game had garnered over a million registered accounts. Seeking to build on this success, Jagex developed a expanded, pay-to-play version of *Runescape* to offer alongside the original version of the title, which was released in 2002. While the company was then seeking advertisers, this new version of *Runescape* gained 5,000 subscriptions within its first week, a significant achievement for a Java pay-to-play title at the time. By late 2003, the number has leaped to 65,000 paying users, and the Jagex workforce expanded to to around 30 staff.

That rapid growth continued unabated through the decade, and by 2007 Jagex could boast over six million active free accounts and one million pay-per-play accounts on its flagship title. Today there are over 400 employees at the firm.

Late in 2007 former European CEO of PayPal Geoff Iddison replaced Constant Tedder as Jagex CEO. Under the leadership of Iddison, the company established FunOrb in 2008. An online games portal with 18 browser-based Java titles available on launch, it marked the beginning of a series of expansions for the studio.

FunOrb expanded into iOS and mobile games in 2009. In 2010, the release of Ultizen's Flash MMORTS *War of Legends* marked the first major release by Jagex' publishing arm, which declared its intentions to release multiple titles from third-party developers. Working with a non-Java title lead the company to change the meaning of its acronym title to 'Just About the Gaming Experience'. Later that same year, Jagex' second MMORPG *Stellar Dawn* was announced, and the rights to the Renegade Games browser-based MMOG Planetarion were purchased soon afterwards.

The continual financial successes of Jagex, along with its long-established positive reputation as an employer, have seen it take numerous awards for industry and employment excellence, including the prestigious Industry Legend prize for the Gower brothers at the Develop Industry Excellence Awards in 2010. As for the future, Jagex has recently scored the rights to develop an MMO based on the Transformers IP, giving the company every change of retaining its status as the UKs largest game development studio.

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TOOLS NEWS

This month: Autodesk, PathEngine, Unity and Ideaworks

Artificial intelligence specialist **Xaitment** has revealed a new collection of what it has called its three most requested AI development tools.

The BrainPack 2011 comes with XaitMap, XaitMove and XaitControl – three AI products which the company is offering together at €6,000.

The firm says this price is 'a fraction of the normal cost of game AI'.

Xaitment products are available on multiple platforms, from Windows to 360, including PS3, Wii, Linux and mobile OS.

BrainPack 2011 comes as a single-seat, one year licence only, though it is promised to be a full SDK that imposes absolutely no limitations.

Updates and upgrades are available to customers, along with access to a moderated support forum.

"You won't need big budgets anymore to implement your own NavMesh generator, pathfinder or scripting engine," said Xaitment CEO Andreas Gerber.

"The barrier to entry will be very low and the return on investment is only the costs of one man-month for the company."

www.xaitment.com

PathEngine has released version 5.26 of its eponymous path-finding AI middleware.

This latest update for the fifth edition features some improvements that were originally reserved for the eventual release of PathEngine 6, the company said.

"What we've done for this release is to basically merge some code from the still-in-development SDK release 6 back to the 5 branch to give us some incremental improvements over previous releases," a spokesperson said.

These improvements come without changes to the middleware's API.

Key optimisations include a new collision preprocess system that can cut generation times by a half, as well as fundamental changes to ground mesh representation to save memory.

www.pathengine.com

Game engine vendor **Unity** has signed an agreement with the latest player in the smartphone games space, Sony Ericsson.

In a statement released by Sony Ericsson, the firm said it is "partnering with Unity Technologies, using its award-winning development platform, to ensure a continuous flow of high quality 3D game titles" for its new PlayStation Phone.

That device, the Xperia Play, is at the time of writing days away from release.

The Xperia Play will run on Google's Android operating system, specifically Google Android 2.3 (Gingerbread).

Unity supports the Android OS as part of its 'deploy anywhere strategy'.

www.unity3d.com

Ideaworks Labs has released the 4.4 version of its Airplay SDK.

The latest build of the the tech outfit's proprietary development toolset lets developers build applications using a single code base before deploying natively to multiple mobile platforms and devices. Version 4.4 introduces the new Extensions Development Kit, which lets users extend Airplay's multi-platform APIs so they can access any OS-specific APIs and third-party libraries they choose.

Airplay SDK 4.4 is a major turning point for multi-platform development," said Tim Closs, CTO of Ideaworks Labs. "With the addition of the Extensions Development Kit, Airplay SDK has strengthened its position as the most efficient, powerful and flexible platform for simultaneous development of rich apps and games across iOS, Android and other smart phone and tablet platforms.

"We're excited to work with the Airplay developer community to use the EDK in building a rich ecosystem of extension APIs and integrations with third-party services."

The newly-released Airplay SDK also caters for the development of previously unsupported models of apps including augmented reality and photography, with three new camera and imaging APIs.

www.ideaworks3d.com

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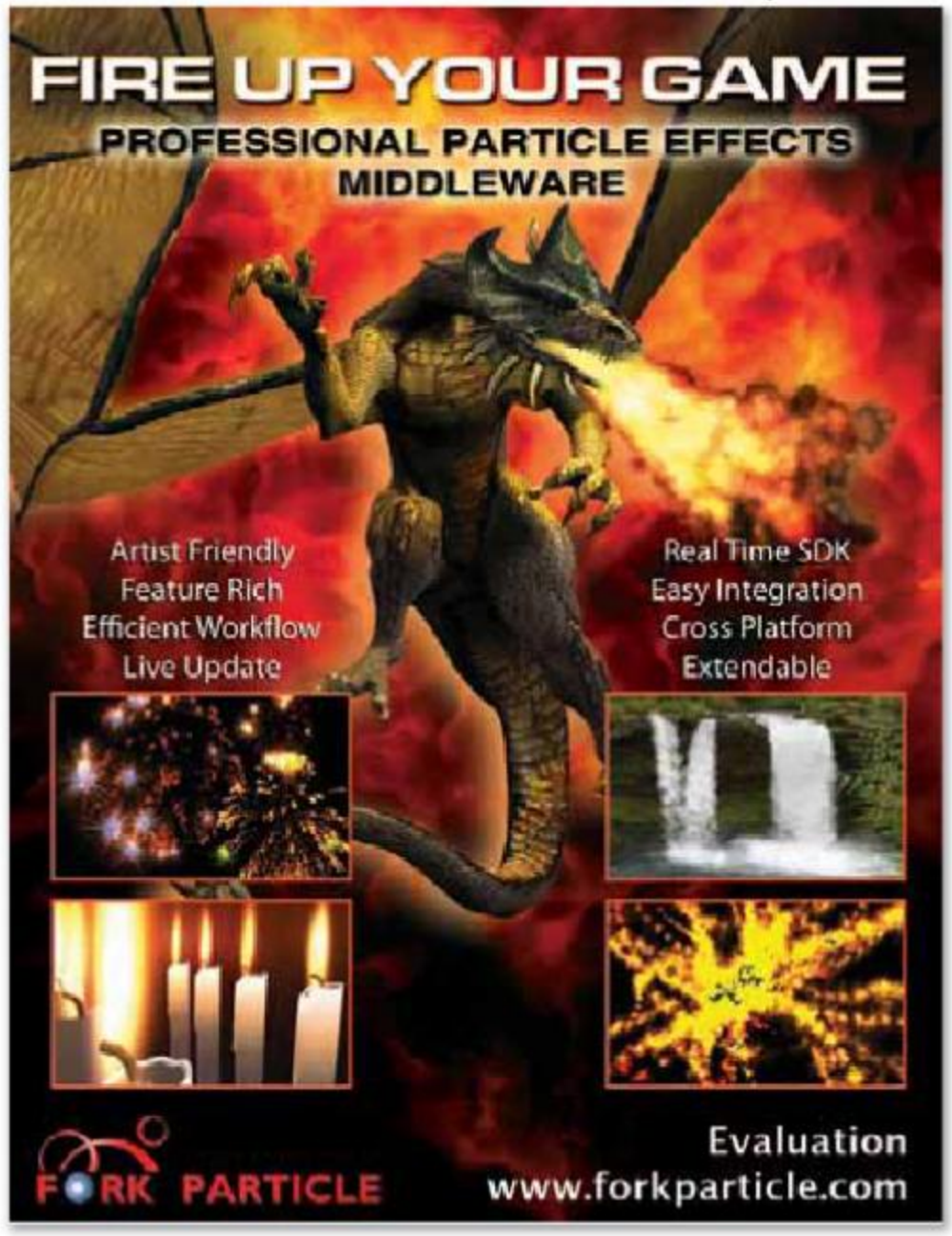

SERVICES NEWS

This month: Image Metrics, Babel, Studio 7 and GameSpy Technology

Facial animation group **Image Metrics** has acquired Big Stage, a company specialising in building game characters from photo data.

Financial terms of the buyout were not disclosed.

Big Stage's software can "instantly transform photographs into realistic 3D, animated characters to represent themselves in virtual worlds, video games, video clips and online communities", an Image Metrics press statement claimed.

The California-headquartered firm has revealed it will merge Big Stage's avatar creation platform into its own animation technology.

An updated product suite is scheduled for release in the third quarter of 2011.

"We are extremely pleased with the talent and technology coming from Big Stage," said Image Metrics CEO Robert Gehorsam.

"Their advanced yet easy-to-use avatar creation technology is the perfect platform to package with our facial animation technology for a complete life-like digital solution for both consumers and developers alike," he added.

www.image-metrics.com

Industry outsourcing group **Babel** has bolstered its in-house team in a bid to offer more dedicated services for MMO creators.

"We found that MMO developer client's needs are quite specialised, both in the initial project and in handling live content updates," said Babel's Bruce Stamm the group's VP of quality assurance.

"Needing large teams that go beyond just translation to full product globalisation, building in-house expertise, is critical for sustained success," he added.

www.babelmedia.com

Studio 7, the East London motion capture firm, has expanded its services with the installation of new technologies.

The facility will now feature a virtual camera system (VCS) and a facial motion capture suite to complement its existing body, hand and prop mocap facility.

Studio 7 claims the virtual camera system delivers rapid content creation, flexibility for taking shots without the hassle of additional keyframes, real-time results and extended animation control at a not unreasonable price.

Key to the studio's success may be its proximity to Soho, which inhabits numerous production houses in TV, film, audio and – increasingly – games.

"We are very excited to have the VCS here in our studio," said managing director Chris Richmond.

"It takes us to another level in terms of the variety and sophistication of scenes clients can record here. Directors and animators can now capture everything they need at one central facility, whilst saving time and budget in post-production."

www.studio7london.com

California-based services and tools firm **GameSpy Technology** is granting open access to its catalog of game services across all platforms.

Studios now have access to a host of well-known tech and APIs via an online self-service process for no initial cost.

"Smart developers are now looking at their games as a whole across all available platforms," said the GameSpy Technology vice president Todd Northcutt.

"We want to empower everyone creating games to make great online experiences and to build bigger, better communities regardless of platform, team size or budget. In an industry first, we are making cross-platform services free, with the hope that we can help more folks make better games."

The available SDKs include open APIs for player data tracking, user-generated cloud storage content tools, social network integration, in-game or web-based commerce and matchmaking services.

www.poweredbygamespy.com

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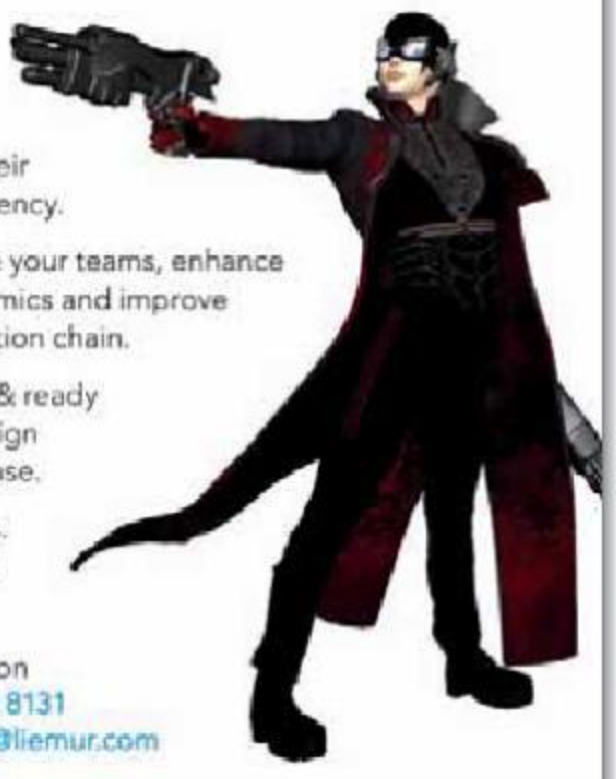

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TRAINING NEWS

This month: Tiga and Sony's GIRL

Trade body **Tiga** has announced Dundee College as its newest academic member.

The campus offers several games development courses and also engages with the industry in various events.

The college said it has joined Tiga "to strengthen our links with games developers throughout the UK, and also to network with Tiga's other education members".

"Dundee has a rich tradition in games development and we are proud to be part of the local games community," said course leader Andrew Mackenzie.

"Our courses are designed to help students enter the games industry directly or go on to further studies. Our teaching is enthusiastic and industry focused. We offer a range of dedicated courses and also promote flexible learning to allow busy people to fit study into their lives."

www.tiga.org

Sony's fourth annual **Gamers In Real Life** (GIRL) scholarship has opened for applications in the US. The initiative hopes to offer more gaming content that appeals to women, and attract females to the industry.

A prize fund of $10,000 will be paid towards the educational expenses of one US undergraduate student of a games industry related subject, as well as a paid internship of up to 10 weeks at one of SOE's development studios.

"Recent industry studies show that although a large percentage of the game playing population is female, they make up only about one in every 10 game developers," said SOE VP of global sales and marketing Laura Naviaux. "For the fourth year in a row, SOE is committed to encouraging women to pursue an exciting and rewarding career."

www.soe.com/girl

The careers of five young Swedish and Scottish developers were given one of the best starts imaginable at the Game BAFTAs last month, together picking up the BAFTA Ones to Watch Award.

The student quintet, named **That Game Studio**, picked up the prestigious honour for their debut project, *Twang*.

That Game Studio's difficult journey to the prize began in February last year when the Dare to Be Digital game design contest started looking for possible contestants. Now, some thirteen long months later, after extended periods of hard work, the group stands with one of the most prestigious awards in British game development.

"We are extremely amazed that we won the award. We can barely believe it," the group said in a statement.

"It's like a kick-start right into the industry; a confirmation that we're doing something right."

The group is made up four students at Skovde University in Sweden (Jocce Marklund, Annette Nielsen, Linus Nordgren and Marcus Heder) and Thomas Finlay from Abertay University.

The Swedish students' stay in the UK was supported by the Scottish Government.

Much of the Dare to Be Digital takes place at Abertay University in Dundee – an institution widely praised as one of the best the UK has to offer for game development.

Dr Louis Natanson, the university's academic director of the Institute of Arts, Media and Computer Games, said that the winning students "have a very bright future ahead of them".

"The standard we expect each year at Dare to be Digital is incredibly high – the student teams that come to Abertay University to build their games are among the most promising anywhere in the world," he added.

"Previous Dare winners have gone on to jobs with the world's leading computer games companies, including Rockstar, Sony and many others. We are absolutely sure that this year's winners will follow in those trail-blazing footsteps."

www.bafta.org

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September 2010 winners:
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If you are really clever you even get a mugshot in the mag

May 11th 2011 winners:
STILL ALL TO PLAY FOR

CODA

A sideways look at the games industry...

THE INDUSTRY
IN 140 CHARACTERS

A month in tweets by the industry elite

@StupidFunWill
Just realized I'm supposed to give a hour-long talk on *Bungeling Bay* in a week and haven't started on it yet, I don't even have a copy :0
(Will Wright, Stupid Fun club)
Saturday, February 26th

@wonderlandblog
Observation: I go to TV confs, digital media confs, games confs. No other media comes close to gameindustry for friendliness, fun & sharing.
(Alice Taylor, Makieworld)
Saturday, March 5th

@PaulinaBees
The thing I'm most excited about at #gdc2011 is Google TV SDK coming soon. Android apps across mobile + TV, build once.
(Paulina Bozek, Inensu)
Friday, March 4th

@TimOfLegend
Someday they will identify the gene that determines if you will LOVE radial menus or HATE them. They are the cilantro of games.
(Tim Schafer, Double Fine)
Sunday, March 6th

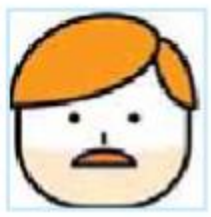
@ian_livingstone
Inspirational GDC. Indy games BIG 'cos of *Minecraft*. Power to the online artists! But for every *Angry Birds* there will be lots of dead birds *(Ian Livingstone, Eidos)*
Saturday, March 5th

@cliffski
It's not the unreal engine, but my new game already has better editing tools in some ways than GSB had. I hope to keep that up.
(Cliff Harris, Positech Games)
Monday, March 7th

@davidhelgason
Unity 1 - GDC 0 :)
(David Helgason, Unity Technologies)
Saturday, March 5th

@numberless
write write write write write *carefully edit xml* write write write write write *carefully edit xml* write write write...
(Scott Jon Siegel, Playdom)
Thursday, March 10th

@megganpez
Know what I do in my hotel room the day after GDC? Sit in my robe/drink coffee/watch video of upgrading thru every version of Windows. yep. *(Meggan Scavio, GDC)* Saturday, March 5th



@fraserlaeto
While I laughed at that *Wii Dare* trailer thing, on reflection I think it's bad that Ubi's been ridiculed into not releasing it in the UK.
(Fraser Simpson, Zoë Mode)
Thursday, March 10th

AN OPEN MIND

Satoru Iwata

Based on his GDC keynote

On how mobile gaming is changing the industry: "We want consumers to appreciate the premium value of software through our platforms. Although Microsoft and Sony are different to us, I believe we all share this idea 100 per cent. We demonstrate a high value of game software. [...] However, smartphones and social platforms are not at all like ours. These platforms have no motivation to maintain a high value of game software. For them, content is just created by someone else. [...] Quantity is how they profit. The value of game software does not matter to them. [...] We really want consumers to appreciate the premium value of content. What we make is valuable, and we should protect that value."

On game development's buoyancy: "Game development is drowning."

IT FIGURES: Angry Birds

Having cost Finnish studio Rovio just $140,000 to create, *Angry Birds* has now made $70 million for the team. Currently the Earth's 6.9 billion residents collectively spend 200 million minutes a day tackling the game's 448 current levels (not including the many Golden Eggs and other hidden extras). The physics puzzler has now been downloaded over 100 million times, costing 59p on iPhone and nothing on the ad-supported Android version. The game is currently the top paid for App in 67 countries worldwide.
www.rovio.com

REWIND

A year in video games: 2006

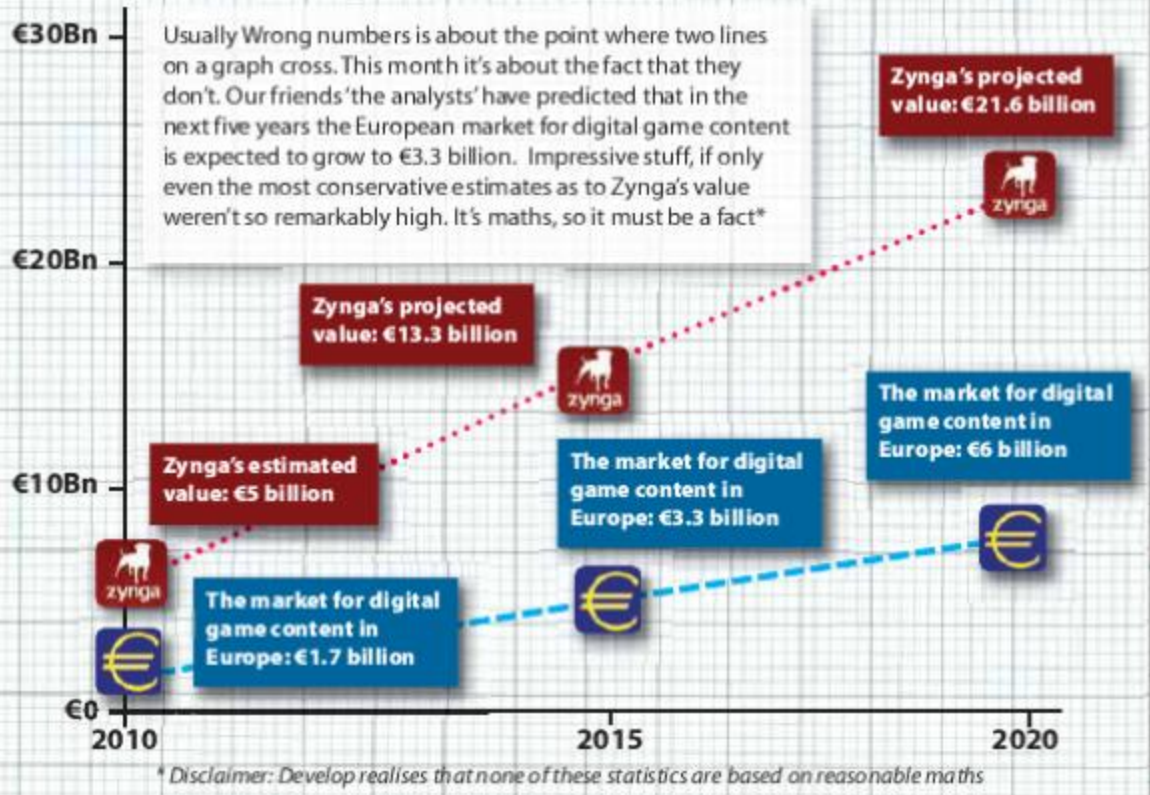
A look back at a time when things were a great deal simpler for those of us making video games

■ The Xbox 360 is launched

Wrong Numbers

Stats can be misleading. Forward-project the trends from the dawn of 2011 and the results show a misguided vision of the future

This month: Zynga dwarves Europe


€30Bn
€20Bn
€10Bn
€0
2010
2015
2020
Usually Wrong numbers is about the point where two lines on a graph cross. This month it's about the fact that they don't. Our friends 'the analysts' have predicted that in the next five years the European market for digital game content is expected to grow to €3.3 billion. Impressive stuff, if only even the most conservative estimates as to Zynga's value weren't so remarkably high. It's maths, so it must be a fact*
Zynga's projected value: €21.6 billion
Zynga's projected value: €13.3 billion
Zynga's estimated value: €5 billion
The market for digital game content in Europe: €6 billion
The market for digital game content in Europe: €3.3 billion
The market for digital game content in Europe: €1.7 billion
zynga

Disclaimer: Develop realises that none of these statistics are based on reasonable maths

DEVIPEDIA

Dissecting the hyperbole of games development

Power Creative

pow.er cre.at.ive – proper noun

What 'they' think it means:
A power creative is a new kind of game developer. The term, coined by Epic's Cliffy B at this year's GDC, defines a template to which we should all mould ourselves. The power creative is an individual developer evolved; self-promoting, social media savvy and not afraid to provoke and engage with their audience. A power creative is a celebrity and a brand, willing to sacrifice anonymity for the good of their product.

What it really means:
'Look at me!'

■ Iwata unveils the Wii controller at TGS
■ *Psychonauts* is released by Double fine
■ The GBA Micro arrives
GAME BOY
TAITO
■ Square Enix buys Taito

develop FORWARD PLANNER

May 2011

With *Develop 100* Insertion

Audio
A fresh look at the music and audio for the games sector, including in-house teams through to outsourcers

Regional Focus: Scotland
Studios from start-ups to commercial powerhouses profiled

June 2011

Middleware
Trends and new releases in third party tech, tools and engines

Regional Focus: Nordic
We look at games development across Scandinavia (Norway, Sweden, Denmark), Iceland and Finland

Event:
E3 – June 7th to June 9th

July 2011

Regional Focus: Guildford
One of UK games dev's many famed clusters goes under the Develop microscope

Events:
Develop Conference – July 19th to July 21st

August 2011

Visual Arts/CG/Game Graphics
New techniques and tech for cutting edge in-game visuals.

Regional Focus: Germany
A profile of the German games sector to accompany GDC Europe/Gamescom.

Event:
GDC Europe – August 15th to August 17th
Gamescom – August 17th to August 21st

September 2011

Artificial Intelligence
The new tricks and tools developers are using to make characters think

MMOs/Online Technology
A round-up of all the new trends and technologies in connected games

Regional Focus: Northern England East & West
What's new in key hubs including Liverpool, Leeds, Sheffield and Newcastle

October 2011

Regional Focus: London
A fresh look at games development in London's capital

Event:
GDC Online – October 10th to October 13th
LGF/LGC – Dates TBC

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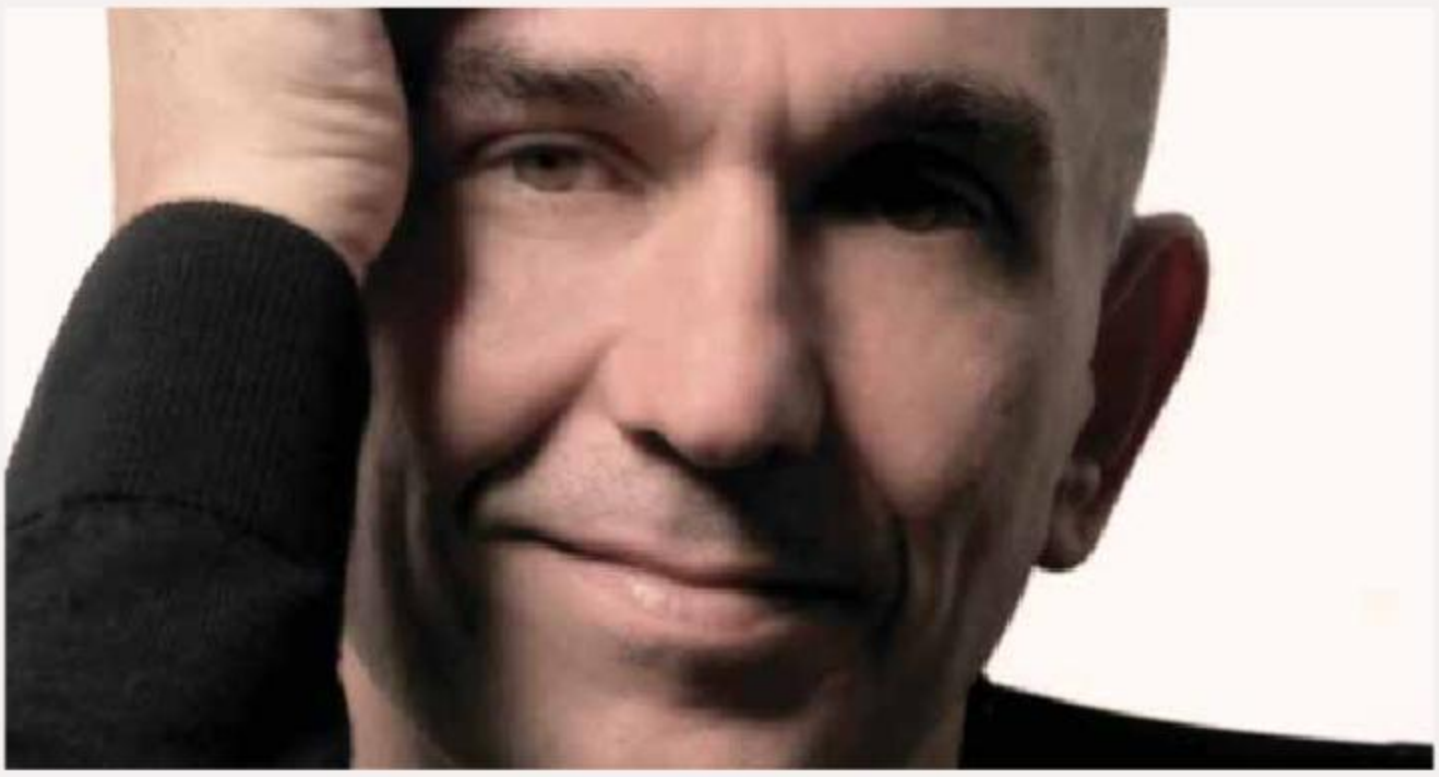
THE FAQ PAGE: PETER MOLYNEUX

Develop grills respected figures from the global development sector…



When not playing board games, Peter Molyneux (above) can be found fondling his herb garden

Who are you and what do you do?
My name is Peter Molyneux. I'm creative director at Lionhead Studios, and I inspire and work with game designers and artists who hopefully create games.

What are you working on right now?
I am working on an undisclosed project.

What was the first video game or product that you ever worked on in the industry?
The very first game I ever worked on that was actually published was a game called *The Entrepreneur*, released in 1984, and that sold only two copies, as far as I know.

What was the first video game you ever played, and did you enjoy it?
It was *Pong*. Before that there were so many board games. I've played games all my life. I could go back to *Snakes and Ladders* and *Monopoly*, and I was obsessed with *Dungeons and Dragons*. I've played so many; I've probably played a good proportion of all the board games that have been released, and I still play them now.

> ***"The first game I ever worked on was a game called The Entrepreneur, released in 1984, and that sold only two copies, as far as I know."***
>
> Peter Molyneux, Lionhead

What is your favourite game ever, and for what reason?
That's a very subjective question, and every time somebody gets asked the question it changes. I love the *Half-Life* series. I adored that and it was to my mind the best first person shooter ever. It had a wonderful blend of story and action. I also loved *Zelda: Ocarina of Time*, and at the moment I'm obsessed with *Minecraft*. Any of those are my favourites.

What do you enjoy about the video games industry today?
It's an ever-changing monster of an industry. It's like a petulant adolescent child that can't quite work out who he is yet.

That's what the industry is, and what I find so exciting is to be seeing how we're growing up and we're coming out of puberty now and we've got social games and mobile games and core games and triple-A and handheld.

The industry is growing into being this fast and crazy world, and possibly at this very second in time something like 100 million people in the world are probably playing some sort of game. It's amazing for me to think that when I started it was about selling games on a trestle table in a hall, and back then at any one time there were probably something like 100 people playing a game worldwide. It's just amazing.

What disappoints you about the video games industry today?
The video games industry, and your career in the industry, is like a roller coaster, and sometimes we're going downhill and it feels so fantastic and exciting.

But there's always the real struggle to get back to the top of the hill. There is real feeling sometimes that the doomsayers who say things like 'console gaming is dead' can get too loud a voice.

I do get frustrated sometimes that we can loose that ability to be passionate and motivational and original because we get a bit too scared. Saying that, there's so many wonderful things happening across the industry today.

What hobbies, collections or interests do you have that are completely unrelated to video games?
I mean there is my family and my son, and my son plays a lot of computer games, but that doesn't really count. It all appears to be related to games. Perhaps I'm a very one-dimensional human being.

There is my herb garden. That's my escape. It's caressing and fondling my herbs.

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